Review Workbook
Contents

The Basic Operations Review

1. Divide and indicate the remainder, if any. Use long division.

   a. 6,764 ÷ 81

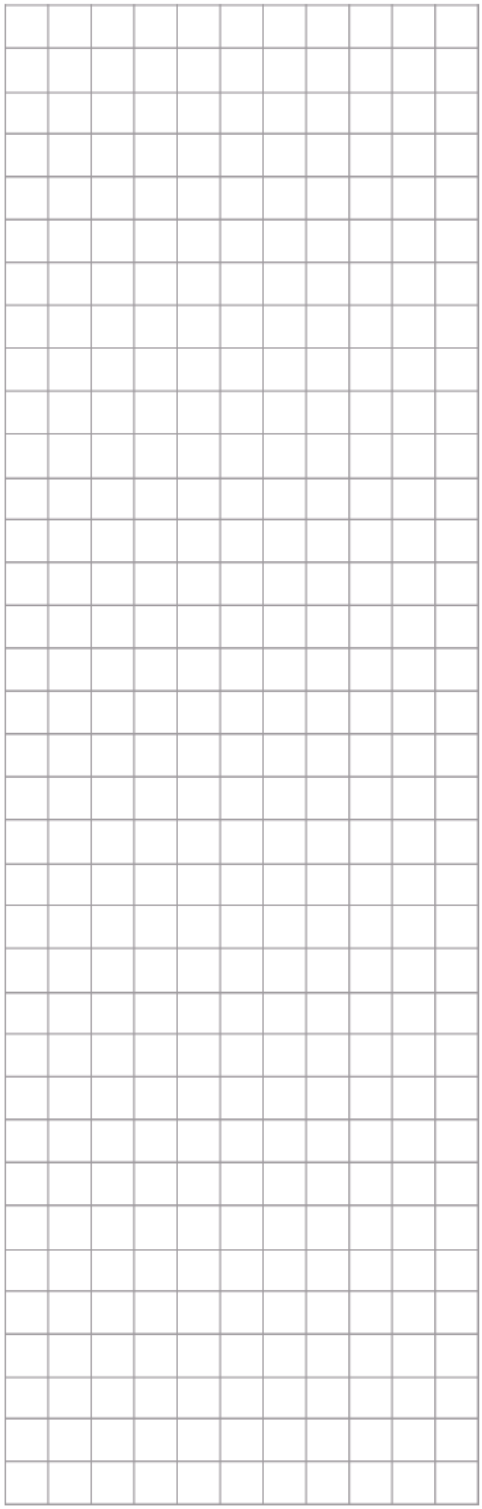
   b. 309,855 ÷ 46

2. How many times can you subtract 9 from 23,391 before you "hit" zero?

3. If you spend exactly $2.25 every day to make a phone call, how much will those phone calls cost you in a year?

4. If 5,000 people need to be moved from place A to place B by buses, and one bus seats 46 people, how many buses are needed?

5. An airplane travels at a constant speed of 880 km per hour. *Estimate* about how long it will take for it to fly 5,800 km.



6. Three boxes of tea bags cost $15.90.
How much do two boxes cost?

7. Write the expressions using an exponent. Then solve.

a. $5 \times 5 \times 5 \times 5$

b. $1 \times 1 \times 1 \times 1 \times 1 \times 1$

c. 30 squared

d. $100 \times 100 \times 100$

e. two to the sixth power

f. three cubed

8. **a.** The perimeter of a square is 80 cm. What is its area?

b. One edge of a cube measures 11 m. What is its volume?

9. Fill in.

a. 25^3 gives us the _____ of a _____ with edges _____ units long.

b. 3×9^2 gives us the _____ of ____ _____ with sides _____ units long.

10. Write in normal form (as a number).

a. $2 \times 10^5 + 3 \times 10^2 + 9 \times 10^0$

b. $2 \times 10^7 + 8 \times 10^6 + 3 \times 10^4 + 1 \times 10^3$

11. Write in order from the smallest to the largest.

a. 10^7 707,000 7,000,000	**b.** 4×10^5 5×10^4 450,000

12. Round to the place of the underlined digit. Be careful with the nines!

a. $14\underline{9},601 \approx$ _____

b. $2,9\underline{9}9,307 \approx$ _____

c. $59\underline{7},104,865 \approx$ _____

d. $559,9\underline{9}8,000 \approx$ _____

The Basic Operations Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 23 points. You can give partial points for partial solutions.

Divide the student's score by 23 and multiply by 100 to get a percentage score. For example, if the student scores 17, divide 17 ÷ 23 with a calculator to get 0.7391. The percentage score is then 73.9% or 74%.

Question #	Max. points	Student score
1	2 points	
2	2 points	
3	2 points	
4	4 points	
5	4 points	

Question #	Max. points	Student score
6	2 points	
7	2 points	
8	2 points	
9	3 points	
TOTAL	23 points	/ 23

The Basic Operations Test

1. Divide 758,908 ÷ 72 and indicate the remainder, if any.
   Use long division.

2. Solve 21 ÷ 11 round to three decimal digits.

3. A box of 75 flashlights costs $937.50. Find the cost of one flashlight.

4. You can scan one page of a book in 43 seconds. Working at the same speed, how long will it take you to scan all 234 pages of the book?
   Give your answer in minutes and seconds.

5. Solve.

   a. 3^3

   b. 1^{10}

   c. 50^2

   d. 10^5

6. The perimeter of a square is 56 cm. What is its area?

7. Write in normal form (as a number).

a. $5 \times 10^8 + 4 \times 10^6 + 3 \times 10^5$

b. $1 \times 10^9 + 6 \times 10^8 + 2 \times 10^4 + 1 \times 10^2$

8. Write in expanded form, using exponents (as in the original in #7).

a. 560,000

b. 9,108,000

9. Round the numbers.

a. 2,998,601 to the nearest ten thousand

b. 483,381,902 to the nearest ten million

c. 19,993,740 to the nearest million

Expressions and Equations Review

1. Write an expression.

   a. the difference of 6 and x, squared

   b. the quotient of 5 and the sum of x and 6

   c. 3 times the quantity 5 minus p

2. Find the value of the expressions.

a. $(1+6)^2 + (10-2)^2$	**b.** $5^2 \cdot 2^3$
c. $\dfrac{21+6}{2 \cdot 1+1}$	**d.** $\dfrac{16}{2} \cdot (120-50)$

3. Find the value of the expressions.

a. $2x + 18$ when $x = 5$	**b.** $\dfrac{35}{z} \cdot 13$ when $z = 5$

4. Write an expression for each situation.

   a. Three friends purchased a scuba diving outfit together for p dollars. They shared the cost equally. How much did each person pay?

   b. You bought play dough for \$3 and six packages of crayons for c dollars each. What was the total cost?

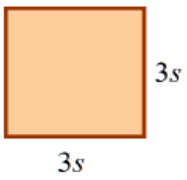
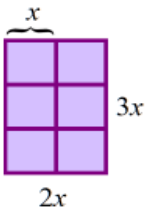
5. Label each thing below as an equation, inequality, or expression.

$2x + 17$ $\quad 8 = 8$ $\quad y < 5$ $\quad 4x - 3 = 8$ $\quad \frac{4}{5}x - 16$ $\quad 4x + y^2 \geq 9$ $\quad M = \frac{44 - x}{5}$

6. Simplify the expressions.

a. $t + t + t + 3$	**b.** $8d - 3d$
c. $x \cdot x \cdot x$	**d.** $12x - 6 - 6x$
e. $z \cdot z \cdot 8 \cdot z \cdot 2$	**f.** $3x^2 + 5 + 11x^2$

7. Write an expression for *both* the area and perimeter of each rectangle. Give them in simplified form.

	
a. A = P =	**b.** A = P =

8. Multiply using the distributive property.

a. $3(2x + 7) =$	**b.** $8(9b + 5) =$

9. Think of the distributive property "backwards," and factor these sums.

a. $5x + 10 =$ ____ $(x +$ ____ $)$	**b.** $6y + 10 =$ ____ (____ + ____)
c. $24b + 4 =$ ____ (____ + ____)	**d.** $25w + 40 =$ ____ (____ + ____)

10. Solve the equations.

a. $7x = 784$	**b.** $3 + z = 119$	**c.** $\frac{x}{6} = 12$
d. $5y + 8y = 784$	**e.** $32 + x = 9 \cdot 40$	**f.** $\frac{r}{6 + 4} = 7$

11. Write an equation for each situation EVEN IF you could easily solve the problem without an equation. Then solve the equation.

a. The value of a certain number of quarters is 1675 cents.
How many quarters are there?

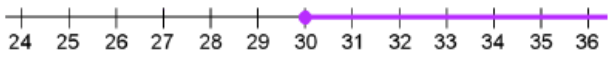
b. The perimeter of a rectangle is 128 meters. One side is 21 meters.
How long is the other side?

12. The formula $F = \frac{9\,C}{5} + 32$ is used to convert temperatures given in Celsius degrees into Fahrenheit degrees.

C denotes the temperature in Celsius degrees, and F denotes the temperature in Fahrenheit. If the temperature in Celsius is 25°C (nice summer weather), find the corresponding temperature in Fahrenheit.

13. Write an inequality that corresponds to the number line plot.

a.



b.

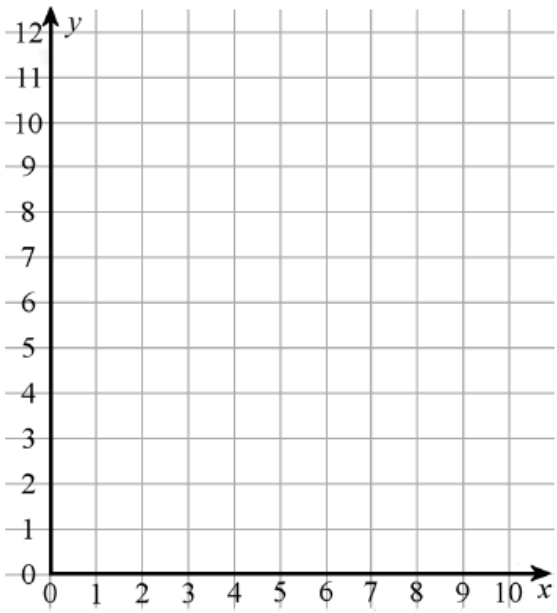
14. **a.** Solve the inequality $y + 2 > 24$ in the set $\{55, 44, 22, 23, 30\}$.

b. What solutions does the inequality $x + 7 \leq 14$ have in the set of even whole numbers?

15. Calculate the values of y according to the equation $y = x + 3$.

x	1	2	3	4	5	6
y						

Now, plot the points.



16. A train is traveling with a constant speed of 70 miles per hour. Consider the variables of time (t), measured in hours, and the distance traveled (d), measured in miles.

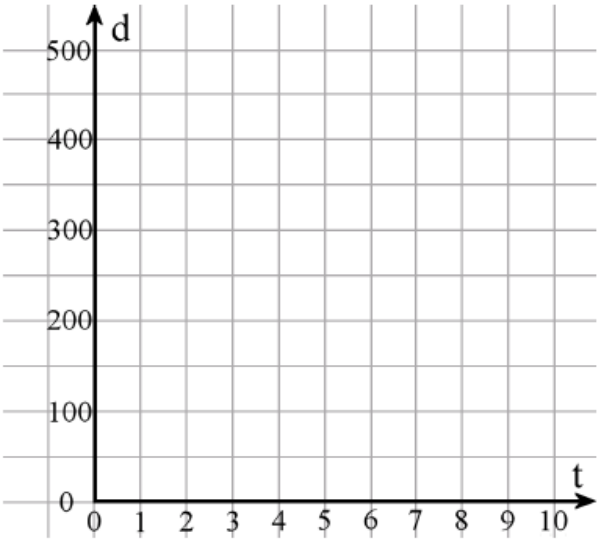
a. Fill in the table.

t (hours)	0	1	2	3	4	5	6
d (miles)							

b. Plot the points on the coordinate grid.

c. Write an equation that relates t and d.

d. Which of the two variables is the independent variable?



Expressions and Equations Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 30 points. You can give partial points for partial solutions.

Divide the student score by 30 and multiply by 100 to get a percentage score. For example, if the student scores 25, divide 25 ÷ 30 with a calculator, getting 0.833333.... The percentage score is then 83%.

Question #	Max. points	Student score
1	3 points	
2	3 points	
3	4 points	
4	2 points	
5	4 points	
6	2 points	

Question #	Max. points	Student score
7	3 points	
8	2 points	
9	2 points	
10	2 points	
11	3 points	
TOTAL	30 points	/30

Expressions and Equations Test

1. Write an expression.

a. the quotient of x squared and 7

b. the quantity 5 minus y, cubed

c. 3 times the quantity $2s$ minus 5

2. Find the value of these expressions.

a. $(100 - 80) \cdot 2 - 20$	**b.** $480 \div 2^3$	**c.** $32 + 0^5 \cdot 12 \div 4$

3. Find the value of the expressions.

a. $2x + 10$ when $x = 5$	**b.** $x^2 + 10$ when $x = 5$
c. $\frac{40 - x}{5}$ when $x = 5$	**d.** $40 - \frac{5}{x}$ when $x = 5$

4. Write an expression.

You purchase a book for p dollars and three pencil cases for t dollars each. What is the total cost?

5. Simplify the expressions.

a. $a \cdot a \cdot a \cdot a$	**b.** $a + a + a + a$
c. $x \cdot x \cdot 5 \cdot 2$	**d.** $8d - 2d + 7$

6. Multiply using the distributive property.

a. $5(x + 6) =$	**b.** $2(9 + 5y) =$

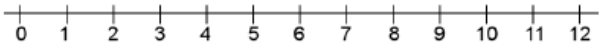
7. Solve the equations.

a. $6x = 144$	**b.** $y + 78 = 134$	**c.** $\frac{x}{16} = 3$

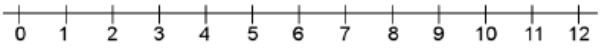
8. Write an equation EVEN IF you could easily solve the problem without an equation! Then solve the equation.

The perimeter of a square is 164 units. How long is its side?

9. Plot these inequalities on the number line.



a. $x \geq 5$



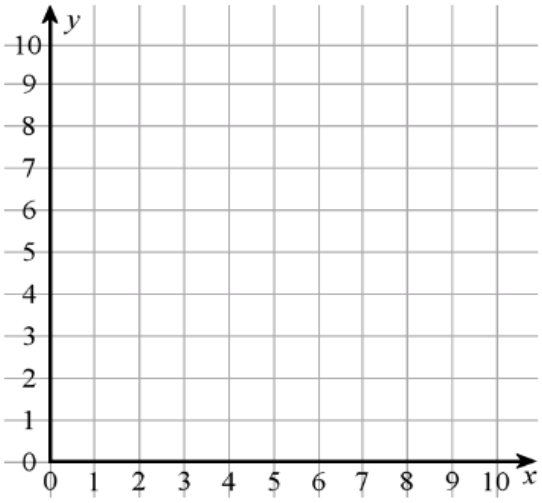
b. $x < 8$

10. Solve the inequality $x + 3 < 20$ in the set $\{15, 16, 17, 18, 19, 20\}$.

11. Calculate the values of y according to the equation $y = 9 - x$.

x	0	1	2	3	4	5	6	7	8	9
y										

Now, plot the points.



Mixed Review 1

1. Solve.

a. 10^5	**b.** 3^4	**c.** $10^5 \cdot 4$

2. Which power of ten is equal to ten million?

3. Express the area (A) or volume (V) as a multiplication, and solve.

a. A square with a side of 3 kilometers: A = _____	**b.** A cube with edges that are 2 inches long: V = _____

4. **a.** The area of a square is 81 cm^2. What is its perimeter?

b. The perimeter of a square is 48 m. What is its area?

5. Write as numbers.

a. 5 trillion, 51 billion, 27 thousand

b. 21 trillion, 650 billion, 99 million, 56

6. Write in normal form (as a number):

$6 \cdot 10^6 + 2 \cdot 10^3 + 1 \cdot 10^0$

7. Write in expanded form using exponents.

a. 54,000

b. 2,090,030

8. Write an expression.

a. the quotient of $5s$ and 8

b. 7 times the quantity x plus 8

c. y less than 8

d. the quantity x minus 8, squared

9. Estimate the result using mental math and rounded numbers. Find the exact value using a calculator. Also, find the error of estimation.

a. $591 \cdot 57{,}200$ Estimation: Exact: Error of estimation:	**b.** $435{,}212 + 9{,}319{,}290$ Estimation: Exact: Error of estimation:

10. Solve. Notice carefully which operation(s) are done first.

a. $4 \cdot 50 + \frac{310}{2} =$ _____	**b.** $\frac{4{,}800}{60} - (70 - 20) =$ _____

11. A bicycle has been discounted by 2/10 of its price, and now it costs $120. Find the price before discount.

12. Divide. Use the space on the left to build a multiplication table for the divisor. Lastly, check.

	$79\overline{)\,5\;6\;2\;7\;9\;0}$	$\cdot \quad 7\;9$

Mixed Review 2

1. **a.** A boat is traveling at the constant speed of 24 kilometers per hour. Fill in the table.

Distance		12 km		24 km		216 km
Time	10 min		50 min		5 1/2 hours	

b. How long will it take for the boat to travel 360 kilometers?

2. **a.** Estimate the answer to $234 \times 1{,}091$.

b. Multiply $234 \times 1{,}091$ (in the space on the right, or in your notebook).

c. Now, estimate the answer to 2.34×1.091.

d. Based on your answers to (b) and (c), what is 2.34×1.091?

3. **a.** Write a subtraction equation where the minuend is 56, the difference is 17, and the subtrahend is the unknown y. Then solve for y.

b. Write a division equation where the quotient is 60, the divisor is 15, and the dividend is unknown. Solve it.

4. Divide mentally in parts.

a. $\frac{636}{6}$ **b.** $\frac{824}{4}$ **c.** $\frac{5{,}607}{7}$ **d.** $\frac{1{,}224}{12}$

5. Find the value of these expressions.

a. $100 - 100 \div 4 \cdot 2$	**b.** $3^3 \div (4 + 5)$
c. $(2 + 6)^2 - (25 - 5)$	**d.** $\frac{12^2 + 9}{5 \cdot 3}$

6. Evaluate the expressions when the value of the variable is given.

a. $3x - 12$ when $x = 5$	**b.** $\frac{y}{3} + 4$ when $y = 24$

7. A rectangle's width is w and its length is l. Which expression tells us the perimeter of the rectangle?

a. lw **b.** $2l + 2w$ **c.** $\frac{l}{w}$ **d.** $l + w + l$ **e.** $l + w$

8. Write an expression for the area (A) or volume (V) using an *exponent*, and solve.

a. A square with sides 11 cm in length: A = _____	**b.** A cube with edges that are all 4 ft long: V = _____

9. The perimeter of a square is 64 cm. What is its area?

10. One pair of shoes costs \$48.60, and another pair costs 2/3 of that price. Alyssa bought both pairs. Find her change from \$100.

11. Divide. If the division is not exact, give your answer to three decimals.

a. $17\overline{)26708 7}$	**b.** $15\overline{)8}$	**c.** $3\overline{)0.13}$

Decimals Review

1. Write as decimals.

a. three ten-thousandths

b. 39234 hundred-thousandths

c. 4 millionths

d. 2 and 5 thousandths

2. Write as fractions.

a. 0.00039

b. 0.0391

c. 4.0032

3. Write as decimals.

a. $\frac{3}{4}$	**b.** $1\frac{2}{5}$	**c.** $\frac{17}{20}$	**d.** $\frac{11}{25}$

4. Fill in the table, noting that 1 micrometer is 1 millionth of a meter ($\frac{1}{1{,}000{,}000}$ of a meter)

Organism	Size (fraction)	Size (micrometers)	Size (decimal)
amoeba proteus	$\frac{600}{1{,}000{,}000}$ meters	_____ micrometers	0.0006 m
protozoa	from $\frac{10}{1{,}000{,}000}$ to $\frac{50}{1{,}000{,}000}$ m	from __10__ to __50__ micrometers	from _____ to _____ m
bacteria	from $\frac{1}{1{,}000{,}000}$ to $\frac{5}{1{,}000{,}000}$ m	from _____ to _____ micrometers	from _____ to _____ m

5. Write in order from the smallest to the largest.

a. 0.0256 0.000526 0.0062	**b.** 0.000087 0.000007 0.00008

6. Round to...

	0.37182	0.04828384	0.39627	0.099568
the nearest hundredth				
the nearest ten-thousandth				

7. Calculate mentally.

a. $0.02 + \frac{4}{1000}$	**b.** $0.7 + \frac{5}{100}$	**c.** $3.021 + \frac{22}{1000}$

8. Calculate. Remember to line up the decimal points.

a. $2.1 - 1.09342$

b. $17 + 93.1 + 0.0483$

9. Find the value of the expression $y + 0.04$ when

a. $y = 0.1$	**b.** $y = 0.01$	**c.** $y = 0.0001$

10. Divide mentally. For each division, write a corresponding multiplication.

a. $0.48 \div 6 =$	**b.** $1.5 \div 0.3 =$	**c.** $0.056 \div 0.008 =$

11. Multiply mentally.

a. $3 \times 0.006 =$	**b.** $0.2 \times 0.6 =$	**c.** $0.9 \times 0.0007 =$

12. 327×4 is 1,308. Based on that, figure out the answer to 32.7×0.004.

13. **a.** Estimate the answer to 8.9×0.061.

b. Calculate the exact answer.

14. Solve the equations by thinking logically.

a. $3 \times$ _____ $= 0.09$	**b.** $0.2 \times$ _____ $= 0.024$	**c.** $0.03 \times$ _____ $= 0.0015$

15. Solve the equations.

a. $0.4p = 90$	**b.** $0.03x = 5.2$	**c.** $y + 0.056 = 0.38$

16. Jim cut seven 0.56-meter pieces out of a 4-meter board.
How much is left?

17. Multiply or divide the decimals by the powers of ten.

a. $10^6 \times 21.7 =$	**b.** $100 \times 0.00456 =$
c. $2.3912 \div 1{,}000 =$	**d.** $324 \div 10^5 =$
e. $10^5 \times 0.003938 =$	**f.** $0.7 \div 10^4 =$

18. Find the value of the expression $\frac{a}{b} + 1$
when $a = 2.068$ and $b = 0.8$.

19. Divide, giving your answer as a decimal. If necessary, round the answers to three decimal digits.

a. $28.2 \div 2$	**b.** $0.11 \div 15$
c. $\frac{4}{9}$	**d.** $\frac{5}{11}$

20. Fill in the entries missing from this table.

Prefix	Meaning	Units - length	Units - mass	Units - volume
			centigram (cg)	
deci-				deciliter (dl)
	ten = 10		decagram (dag)	
				hectoliter (hl)

21. Change into the basic unit (meter, liter, or gram). Think of the meaning of the prefix.

a. 34 dl **b.** 89 cg **c.** 16 kl

22. Convert the measurements into the given units.

a. 2.7 L = _____ dl = _____ cl = _____ ml

b. 5,600 m = _____km = _____ dm = _____ cm

c. 676 g = _____ dg = _____ cg = _____ mg

23. You have eleven empty pop bottles. Six are 350 ml, two are 2 liters, and three are 9 dl. What is the total amount of water that you can put into them?

24. Convert into the given units. Round your answers to 2 decimals if needed.

a. 56 oz = _____ lb	**c.** 2.7 gal = _____ qt	**e.** 0.48 mi = _____ ft
b. 134 in = _____ ft	**d.** 0.391 lb = _____ oz	**f.** 2.45 ft = _____ft _____ in

25. For a parade, each of 230 children needs a ribbon that is at least 2 feet long. If you buy a 500-ft roll of ribbon, how long (in feet and inches) will the ribbons be if you divide the roll equally?

26. One yard is 0.9144 meters. Which is a better deal:
40 yards of rope for $15.99
or 100 meters of rope for $40?

27. A scientist measured the length of some tadpoles caught from a pond. The recorded lengths are below, in centimeters. Find the average length of the tadpoles.
3.2 3.1 3.4 3.1 3.5 2.9 2.7 2.7 3.0 3.0 3.1
3.4 3.2 2.8 2.8 2.9 3.6 3.4 2.9 3.4 3.1

Decimals Test

A calculator is not allowed. Since the test is long, consider allowing the student to take a break in between, or administer it in two parts.

My suggestion for grading is as follows. The total is 66 points. You can give partial points for partial solutions.

Divide the student score by 66 points and multiply by 100 percent to get a percentage score. For example, if the student scores 51, divide 51 ÷ 66 with a calculator, getting 0.77272727. The percentage score is then 77%.

Question #	Max. points	Student score
1	6 points	
2	3 points	
3	3 points	
4	4 points	
5	6 points	
6	6 points	
7	4 points	

Question #	Max. points	Student score
8	6 points	
9	3 points	
10	4 points	
11	9 points	
12	2 points	
13	2 points	
14	8 points	
TOTAL	66 points	/ 66

Decimals Test

1. Write as decimals.

a. five thousandths	**b.** 382 hundred-thousandths
c. 1 and 3,658 millionths	**d.** 94 ten-thousandths
e. $\frac{13}{20}$	**f.** $8\ \frac{2}{25}$

2. Write as fractions.

a. 2.0045	**b.** 0.000912	**c.** 7.49038

3. Calculate without a calculator.

a. $0.2 + \frac{5}{1000}$	**b.** $0.07 + \frac{3}{100}$	**c.** $2.022 + \frac{33}{1000}$

4. Solve without using a calculator.

a. 2.31×0.04

b. $3.38758 \div 7 + 0.045$

5. Round to...

	0.0882717	0.489932	1.299959
the nearest thousandth			
the nearest hundred-thousandth			

6. Multiply or divide mentally.

a. $0.24 \div 3 =$	**b.** $5.4 \div 0.6 =$	**c.** $0.081 \div 0.009 =$
d. $2 \times 0.05 =$	**e.** $8 \times 0.009 =$	**f.** $11 \times 0.0005 =$

7. A rectangular plot of land has sides that measure 50.5 m and 27.6 m.
This plot is then divided into four equal pieces. What is the area of each fourth?

8. Multiply or divide these decimal numbers.

a. $1{,}000 \times 0.02 =$	**b.** $100 \times 0.0047 =$
c. $10^6 \times 1.097 =$	**d.** $0.6 \div 100 =$
e. $12.45 \div 10{,}000 =$	**f.** $324 \div 10^5 =$

9. Find the value of the expression $0.04 \div y$, when

a. $y = 4$	**b.** $y = 0.04$	**c.** $y = 10$

10. Change into the basic unit (meter, liter, or gram).

a. 56 mm

b. 9 km

c. 9 cg

d. 16 dl

11. Convert the measurements into the given units.

a. 2.7 km = _____ m = _____ cm = _____ mm

b. 5,600 ml = _____ cl = _____ dl = _____ l

c. 0.6 g = _____ dg = _____ cg = _____ mg

12. A newborn baby weighs 7 pounds 6 ounces.
Is this more or less than 7.4 pounds?

13. Which is a better deal:
A 1-pint bottle of honey that costs $7,
or a 24-oz bottle of honey that costs $12?

14. Divide, giving your answer as a decimal. If necessary, round the answers to three decimal digits.

a. $5.36 \div 0.2$	**b.** $1.6 \div 0.05$
c. $22.9 \div 7$	**d.** $\frac{8}{9}$

Mixed Review 3

1. Which power of ten is equal to a hundred million?

2. Write in expanded form using exponents.

   3,500,480

3. Estimate the result using mental math and rounded numbers. Find the exact value using a calculator. Also, find the error of estimation.

a. $213 \cdot 5{,}829$ Estimation: Exact value: Error of estimation:	**b.** $435{,}212 \div 993$ Estimation: Exact value: Error of estimation:

4. Evaluate the expression for the given values of the variable c.

c	$c + \frac{2c}{5}$
10	$10 + \frac{2 \times 10}{5} = 10 + 4 = 14$
15	

c	$c + \frac{2c}{5}$
20	
25	

5. The gas gauge shows 5.1 gallons of gasoline left, and that is 3/10 of the volume of the gas tank. How much does the gas tank hold when full?

6. Eric bought two printers. One cost $98 and the other cost 6/7 of that price. Find the total cost.

7. Simplify.

a. $\frac{15 + 150}{5}$	**b.** $\frac{5}{15 + 5}$	**c.** $\frac{380 + 10}{12 - 9}$

8. Write an expression.

a. the quantity $t - 1$ squared

b. x less than 9

c. 7 more than S

d. 8 times the sum of 4, x, and 2

e. the quotient of x^2 and the quantity $x + 1$

9. Evaluate the expressions for the given value of the variable.

a. $3x - 11$ when $x = 8$	**b.** $\frac{3}{z} \cdot 7$ when $z = 5$

10. Simplify the expressions.

a. $x \cdot x \cdot x \cdot x \cdot x$	**b.** $p + 2 + p$
c. $5 \cdot x \cdot x \cdot 2 \cdot x$	**d.** $9z - 2z + z$
e. $f + f + x + x + f$	**f.** $6 + s + 2s + 4$

11. Write an inequality for each phrase. You will need to choose a variable to represent the quantity in question.

a. The AC runs at least 18 hours per day.

b. The jacket can cost a maximum of $40.

c. She is over 12 years old.

12. Solve the inequality $x + 1 < 8$ in the set $\{3, 4, 5, 6, 7, 8\}$.

13. Multiply using the distributive property.

a. $3(5x + 6) =$	**b.** $2(8x + 2 + y) =$

14. Solve the equations.

a. $x + 78 = 412$ $=$ $=$	**b.** $\frac{x}{9} = 600$ $=$ $=$	**c.** $y - 5 = 12 + 18$ $=$ $=$

Mixed Review 4

1. Four parents shared the cost of $207.48 for hosting a parent meeting in this way: one parent paid half of the bill, and the rest was divided equally between the rest of the parents. How much did each parent pay?
Hint: you can draw a bar model to help.

2. Write in normal form (as a number).

a. $3 \cdot 10^8 + 2 \cdot 10^7 + 9 \cdot 10^6 + 3 \cdot 10^2$

b. $1 \cdot 10^6 + 5 \cdot 10^4 + 3 \cdot 10^0$

3. Round to the place of the underlined digit. Be careful with the nines!

a. $5,699,528 \approx$ _____

b. $219,997,101 \approx$ _____

c. $82,788,000 \approx$ _____

d. $3,999,992,567 \approx$ _____

4. Evaluate the expression for the given values of the variable x.

Variable	Expression $\frac{x^2}{3}$	Value
$x = 1$	$\frac{1^2}{3}$	$\frac{1}{3}$
$x = 2$		

Variable	Expression $\frac{x^2}{3}$	Value
$x = 3$		
$x = 5$		

5. Write an expression for each scenario, and then find its value.

a. The sum of 12 and 56 divided by 4.

b. The quotient of 8 and the quantity 4 to the third power.

6. Simplify the expressions.

a. $c \cdot c \cdot c \cdot 8 \cdot c$	**b.** $7c - 2c + 8$
c. $t + t + t + 3 - 2t$	**d.** $2x^2 + 5 + 11x^2 + 8$

7. Write an expression for each situation.

a. Anna has m marbles. She gave 1/3 of them to her friend. How many marbles did her friend get?

b. Sadie is s years old. Fanny is 6 years younger than Sadie. How old is Fanny?

c. How old will Sadie be in 5 years?

d. How old will Fanny be in 5 years?

8. Solve these equations.

a. $7x + 2x = 54$ $=$ $=$ $=$	**b.** $8r - 3r = 40$ $=$ $=$ $=$	**c.** $t \div 50 = 5 + 6$ $=$ $=$ $=$
d. $w - 88 = 20 \cdot 60$ $=$ $=$ $=$	**e.** $2x - 6 = 16$ $=$ $=$ $=$	**f.** $8x + 17 = 81$ $=$ $=$ $=$

9. Think of the distributive property "backwards," and factor these sums.

a. $16y + 12 =$ ____ $(y +$ ____ $)$	**b.** $9x + 9 =$ ____ (____ + ____)
c. $54c + 24 =$ ____ (____ + ____)	**d.** $15a + 45 =$ ____ (____ + ____)

10. Solve the equations.

a. $x + 4.5039 = 7$	**b.** $0.938208 - x = 0.047$	**c.** $2x = 6.0184$

Ratios Review

1. Write the equivalent ratios.

a. $\frac{4}{3} = \frac{20}{\square}$	**b.** 6 : 7 = 18 : _____	**c.** _____ to 30 = 2 to 15	**d.** $\frac{7}{3} = \frac{\square}{12}$

2. Simplify the ratios.

a. $\frac{15}{35} = \frac{\square}{\square}$	**b.** $\frac{6}{16} = \frac{\square}{\square}$	**c.** 33 : 30 = ____ : ____	**d.** 9 : 12 = ____ : ____

3. **a.** Draw a picture where there are 2 hearts for each 3 triangles, and a total of 15 triangles.

b. Fill in the unit rates:

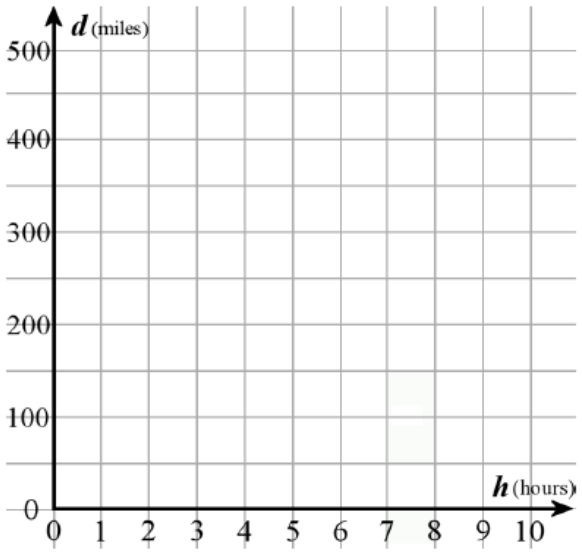
_____ hearts for **1** triangle

_____ triangles for **1** heart

4. A car traveled 300 miles in 6 hours with a constant speed. Fill in the table of equivalent rates:

Miles					
Hours	1	2	3	4	5

Miles					
Hours	6	7	8	9	10



a. Plot the points in the coordinate grid.

b. What is the unit rate?

c. How far would the car go with that speed in 7 1/2 hours?

d. How long would it take for it to travel 225 miles?

5. A mixture of salt and water contains 20 grams of salt and 1200 grams of water.

a. Write the ratio of salt to water, and simplify it to lowest terms.

b. Use the same ratio of salt to water. If there are 100 grams of salt, how many grams of water would be needed?

6. Mom's and Dad's ages are in a ratio of 11:12. Dad is 3 years older than Mom. How old are Mom and Dad?

7. A bean plant is 3/5 as tall as a tomato plant. The tomato plant is 20 cm taller than the bean plant.

a. What is the ratio of the bean plant's height to the tomato plant's height?

b. How tall is the bean plant? The tomato plant?

8. The aspect ratio of a television screen is 16:9 (width to height), and it is 63 cm high. What is its width?

9. **a.** If 12 kg of chicken feed costs $20, how much would 5 kg cost?

b. What is the unit rate? (price per 1 kg)

10. Use ratios to convert the measuring units. 1 kg = 2.2 lb, and 1 ft = 30.48 cm.

a. 134 lb into kilograms
b. 156 cm into feet

Ratios Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 35 points. You can give partial points for partial solutions.

Divide the student score by 35 points and multiply by 100 percent to get a percentage score. For example, if the student scores 25, divide 25 ÷ 35 with a calculator to get 0.71428. The percentage score is then 71%.

Question #	Max. points	Student score
1	4 points	
2a	1 point	
2b	2 points	
3	5 points	
4a	1 point	
4b	2 points	
5	2 points	
6a	1 point	
6b	2 points	

Question #	Max. points	Student score
7	3 points	
8a	1 point	
8b	2 points	
8c	2 points	
9	3 points	
10	4 points	
TOTAL	35 points	/ 35

Ratios Test

1. Write the equivalent ratios.

a. $\frac{3}{5} = \frac{18}{\square}$	**b.** 2 : 3 = 18 : ____	**c.** ____ to 45 = 2 to 9	**d.** 12 : 30 = ___ to 5

2. **a.** Draw a picture where there are 4 rectangles for each 3 triangles, and a total of 16 rectangles.

   b. Fill in the unit rates:

   _____ rectangles for **1** triangle

   _____ triangles for **1** rectangle

3. Fill in the missing numbers to form equivalent rates.

a. $\frac{4\text{ L}}{10\text{ m}^2} = \frac{\quad}{5\text{ m}^2} = \frac{10\text{ L}}{\text{m}^2}$	**b.** $\frac{\$9}{6\text{ min}} = \frac{\quad}{2\text{ min}} = \frac{\quad}{10\text{ min}} = \frac{\quad}{1\text{ hour}}$

4. A mole can dig 3.6 meters in 36 minutes.

   a. What is the unit rate?

   b. Digging at the same speed, how far can the mole dig in 17 minutes?

5. You can buy 14 song downloads for $2.10.
   How much would 3 songs cost?

6. The length and width of a rectangle are in a ratio of 8:5.
   The shorter side is 15 cm.

   a. Find the longer side of the rectangle.

   b. Find the area of the rectangle.

7. You are mixing juice concentrate and water in a ratio of 1:7. How much water and how much concentrate do you need to make 4 liters of diluted juice?

8. A large passenger airplane burns about 35 gallons of fuel per 7 miles.

a. Write a rate from this, and simplify it to the lowest terms.

b. How far can the airplane travel with 500 gallons of fuel?

c. How many gallons will the airplane need to travel 150 miles?

9. Anita and Michael divided a job of folding advertisements for inserts in 1,200 newspapers in a ratio of 3:5. Calculate how many inserts each one of them folded.

10. Use ratios to convert the measuring units. 1 in. = 2.54 cm, and 1 ft = 30.48 cm.

a. 60 cm into inches
b. 4.5 feet into cm

Mixed Review 5

1. Write the division equation, if the calculation to check it is $13 \times 381 + 5 = 4{,}958$.

2. Solve $43 \div 9$ to three decimal digits.

3. Round to the place of the underlined digit. Be careful with the nines!

a. $51{,}\underline{9}99{,}601 \approx$ _____ **b.** $109{,}\underline{9}99{,}339 \approx$ _____

4. Multiply or divide mentally.

a. $3 \times 0.25 =$ _____ $4 \times 0.025 =$ _____	**b.** $8 \times 0.08 =$ _____ $100 \times 0.0008 =$ _____	**c.** $1 \div 0.05 =$ _____ $4 \div 0.05 =$ _____	**d.** $0.99 \div 11 =$ _____ $0.06 \div 0.001 =$ _____

5. Multiply or divide the decimals by the powers of ten.

a. $10^5 \times 3.07 =$	**b.** $10^4 \times 0.00078 =$
c. $12.7 \div 10^3 =$	**d.** $5{,}600 \div 10^5 =$

6. The area of a square is $4y^2$. What is the length of one side?

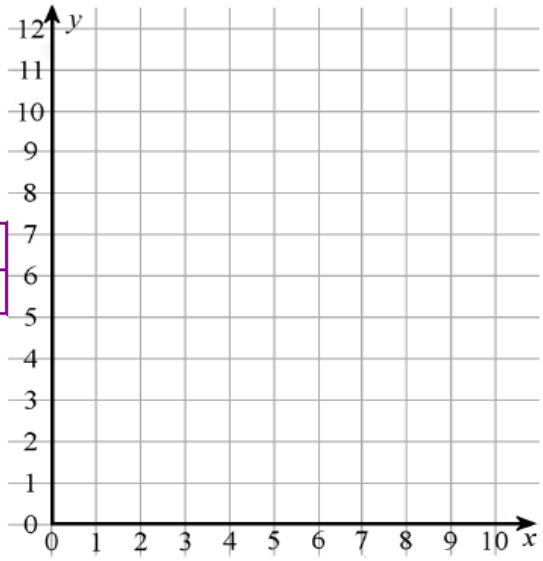
7. Fill in the table.

Expression	the terms in it	coefficient(s)	Constants
$2a + 3b$			
$10s$			
$11x + 5$			
$8x^2 + 9x + 10$			
$\frac{1}{6}p$			

8. Xavier and Yvonne got 10 small cookies from their mom to share. They did not have to share them equally. Let us consider the cookies Xavier got (X) and the cookies Yvonne got (Y).

a. Fill in the table with possible values for X and Y, and plot the points in the grid.

X									
Y									



b. Write an equation that relates X and Y.

c. Which of the two variables is the independent variable?

9. Write an expression for each situation.

a. the value, in cents, of n nickels (n is a whole number)

b. You have 67 drawings and you throw away y of them. How many do you have now?

c. The original price of a puzzle is p. Now it is discounted and costs only 8/10 as much. What is the current price?

10. Divide, giving your answer as a decimal. If necessary, round the answers to three decimal digits.

a. $675.5 \div 0.3$	**b.** $\frac{2}{7}$

Mixed Review 6

1. Write the statements as equations. Then solve the equations.

a. The quotient of a secret number and 11 is equal to 12.	**b.** The sum of 3, 5, and a certain number is 105.

2. Solve the equations.

a. $x \div 6 = 40 + 50$	**b.** $1{,}000 - x = 40 \cdot 6$	**c.** $8x + 2x = 15 \cdot 6$

3. The numbers below are prices for sets of 12 colored pencils from seven different stores.

$3.89 $3.99 $4.45 $3.79 $4.10 $4.19 $4.02

a. Find the average price.

b. How much will the teacher save if she buys 100 sets of the pencils at the cheapest price as compared to the most expensive price?

4. Calculate.

a.	**b.**	**c.**
$10 \cdot 0.009 =$	$40 \cdot 0.08 =$	$0.1 \cdot 0.2 \cdot 0.3 =$
$0.5 \cdot 0.6 =$	$1{,}000 \cdot 1.2 =$	$0.11 \cdot 0.02 =$
d.	**e.**	**f.**
$10 \div 0.2 =$	$0.075 \div 0.025 =$	$2.36 \div 2 =$
$0.6 \div 0.2 =$	$0.3 \div 0.02 =$	$0.0045 \div 5 =$

5. Write the amounts in basic units (meters, grams, or liters).

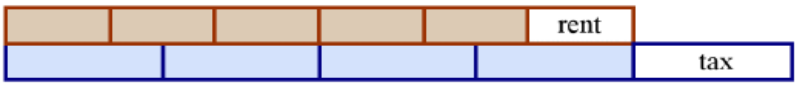
a. 6 kg = _____ g 5 dl = _____ L 5 mm = _____ m	**b.** 7 dam = _____ m 5 hl = _____ L 30 cg = _____ g	**c.** 7 kl = _____ L 50 mg = _____ g 8 cm = _____ m

6. We often compare the size of people and animals by comparing their weights.
Tim weighs 45 kg, and a grasshopper weighs 3,000 mg.

a. How many times more does Tim weigh than the grasshopper?

b. Assuming that they were somehow packaged to carry,
could you carry the weight of a thousand grasshoppers?

7. Elaine paid 1/5 of her salary for taxes. Then she paid 1/6 of what was left for rent.
Then she had $1,000 left. How much was her salary?



8. Divide. If necessary, round your answer to three decimal digits.

a. 45.7 ÷ 0.02	**b.** 928 ÷ 0.003	**c.** $\frac{5}{8}$

Percentage Review

1. Find a percentage of a number	2. A fractional part as a percent
What is 60% of 300 miles? Calculate 0.6 × 300 miles = 180 miles. Or, using mental math, first calculate 10% of 300 miles, which is 1/10 of it, or 30 miles. Then multiply 6 × 30 miles = 180 miles. *Of the 15,400 workers in a city, 22% work in a steel factory. How many workers is that?* Calculate: 0.22 × 15,400 = 3,388 workers.	*What percent is 600 g of 2 kg?* Write the fraction $\frac{600\text{ g}}{2{,}000\text{ g}} = \frac{6}{20} = \frac{30}{100} = 30\%$. *One backpack costs $18 and another $29. What percent is the price of the cheaper backpack of the price of the more expensive one?* Write the fraction $\frac{\$18}{\$29} = 0.6206... \approx 62\%$.
1. Change the percentage into a decimal. 2. Then multiply the number by that decimal. Alternatively, use mental math shortcuts for finding 5%, 10%, 20%, 25%, 50%, *etc.* of a number.	1. First write the fraction. Note that the two quantities in the fraction must both be in the same units: both grams, both meters, both dollars, *etc.* 2. Then convert the fraction into a decimal and finally a percent.

1. Write as percentages, fractions, and decimals.

a. _____% = $\frac{68}{100}$ = _____	**b.** 7% = ▭ = _____	**c.** _____% = ▭ = 0.15
d. 120% = ▭ = _____	**e.** _____% = $\frac{224}{100}$ = _____	**f.** _____% = ▭ = 0.06

2. Fill in the table. Use mental math.

percentage ↓ number →	6,100	90	57	6
1% of the number				
4% of the number				
10% of the number				
30% of the number				

3. A skating group has 15 girls and 5 boys.
What percentage of the skaters are girls?

4. Write as percentages. You may need long division in some problems.
If necessary, round your answers to the nearest percent.

a. 3/4

b. 2/25

c. 1 5/8

5. Emma is 5 ft 4 in. tall and Madison is 4 ft tall. How many percent is Emma's height of Madison's height?

6. A cheap chair costs $25. The price of another chair is 140% of that. How much does the other chair cost?

7. A bag has 25 green marbles and some white ones, too. The green marbles are 20% of the total. How many marbles are there in total? How many white marbles are there?

8. Andrew earns $2,000 monthly. He pays $540 of his salary in taxes. What percentage of his income does Andrew pay in taxes?

9. Which is cheaper, an $18 shirt discounted by 20%, or a $16 shirt discounted by 10% ?

10. (*Challenge*) One square has sides 2 cm long, and another has side 4 cm long. How many percent is the area of the smaller square of the area of the larger square?

Percentage Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 36 points. You can give partial points for partial solutions.

Divide the student score by 36 to get a percentage score. For example, if the student scores 24, divide 24 ÷ 36 with a calculator, getting 0.6666666... The percentage score is then 67%.

Question #	Max. points	Student score
1	6 points	
2	9 points	
3	2 points	
4	2 points	
5	2 points	
6	2 points	
7	2 points	

Question #	Max. points	Student score
8	2 points	
9	2 points	
10	3 points	
11	2 points	
12	2 points	
TOTAL	36 points	/ 36

Percentage Test

A calculator is not allowed.

1. Write as percentages, fractions, and decimals.

a. _____% = $\frac{45}{100}$ = _____	**b.** 179% = $\frac{\square}{\square}$ = _____	**c.** _____% = $\frac{\square}{\square}$ = 0.02

2. Fill in the table. Use mental math.

percentage / number	**5,200**	**80**	**9**
1% of the number			
3% of the number			
70% of the number			

3. Write 4/7 as a percentage. Round your answer to the nearest percent.

4. A toy costs $12. It is discounted by 30%. What is the new price?

5. A cap costs $7.00. Another cap costs 120% of the price of the first cap. How much does the second cap cost?

6. A store got a shipment of 120 T-shirts. Forty percent of them are white. How many T-shirts are *not* white?

7. A store window shows 2 red caps and 8 green caps. What percentage of the caps are red?

8. The chess club has 24 members, of which 8 are girls.
What percentage of the members are boys?

9. Annie is 144 cm tall and Jessie is 160 cm tall.
What percentage of Jessie's height is Annie's height?

10. Which is cheaper, $35 jeans discounted by 10%,
or $40 jeans discounted by 20%?

How many dollars cheaper is it?

11. Andrew pays 20% of his salary in taxes. Andrew paid $400 in taxes.
Find Andrew's salary in dollars.

12. A town has 2,100 senior citizens, which is 15% of the total population of the town.
Calculate the total population of the town.

Mixed Review 7

1. Divide using long division in your notebook. Then, check your result.

a. 339,427 ÷ 26 = _____ R _____ _____ × _____ + _____ = _____	**b.** 6,594 ÷ 145 = _____ R _____ _____ × _____ + _____ = _____

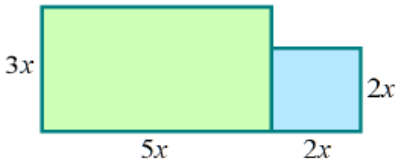
2. Compare and write < , > , or = .

a. 659,000 ☐ 10^6	**b.** 10 billion ☐ 10^9	**c.** $10^6 + 10^2$ ☐ 1,001,000
d. 4^3 ☐ 3^4	**e.** 2^3 ☐ 3^2	**f.** 9×10^4 ☐ 2×10^5

3. Evaluate the expressions when the value of the variable is given.

a. $150 - 7s$ when $s = 9$	**b.** $\frac{3+x}{x}$ when $x = 5$

4. Write in simplified form an expression for the area and an expression for the perimeter of the shape.



5. Simplify the expressions.

a. $y + 7 + 3y$	**b.** $r \cdot r \cdot r \cdot 8$

6. A typical ruler a student might use is 30 cm long. How long would it be in inches? (1 inch = 2.54 cm)

7. Choose the expressions that have the value 6.

a. 18 ÷ 3	**b.** 1.8 ÷ 0.03	**c.** 0.18 ÷ 0.03	**d.** 1.2 ÷ 0.2
e. 360 ÷ 6	**f.** 3.6 ÷ 0.6	**g.** 0.00036 ÷ 0.00006	**h.** 0.9 ÷ 1.5
i. 0.9 ÷ 0.15	**j.** 0.009 ÷ 0.0015	**k.** 0.0012 ÷ 0.002	**l.** 0.0006 ÷ 0.0001

8. One paper clip weighs 14 dg. They are sold in boxes of 200.

a. Calculate the weight of the box, in grams.

b. If someone wanted 1 kg of paperclips, how many boxes would he need to buy?

9. Sandra gets paid \$6 for every 15 minutes she works. Fill in the missing numbers to form equivalent rates.

$$\frac{\quad}{5 \text{ min}} = \frac{\$6}{15 \text{ min}} = \frac{\quad}{20 \text{ min}} = \frac{\quad}{25 \text{ min}} = \frac{\quad}{1 \text{ hr}}$$

10. The width and length of a rectangle are in a ratio of 1:7, and its perimeter is 120 mm. Find the rectangle's width and length.

11. On the average, Gary makes a basket eight times out of every ten shots. How many baskets can he expect to make when he practices 25 shots?

12. Solve the equations.

a. $312 = x + 78$ $=$ $=$	b. $\frac{z}{2} = 60 + 80$ $=$ $=$	c. $7y - 2y = 45$ $=$ $=$

13. The formula $m = 0.3048f$ can be used to convert feet into meters. The variable f is the length in feet, and the variable m is the length in meters. Use the formula to convert 89 feet into meters. Give your answer to two decimals.

14. A car travels with a steady speed of 24 miles per 30 minutes. Fill in the table.

Distance		24 miles				
Time	10 min	30 min	50 min	1 hour	2 1/2 hours	3 hours

Mixed Review 8

A calculator is allowed only in the last problem.

1. Write as decimals.

   a. 392 hundred-thousandths

   b. 5 and 15 ten-thousandths

   c. 23 millionths

   d. 12 and 12 thousandths

2. Write as fractions.

   a. 0.000016

   b. 2.9381

   c. 0.39402

3. Find the value of the expression $y - 0.05$ when

a. $y = 1$	b. $y = 0.1$	c. $y = 1.1$

4. Round to...

	2.97167	0.046394	2.33999	1.199593
the nearest tenth				
the nearest thousandth				

5. Multiply both the dividend and the divisor by the same number, so that the divisor will be a whole number. Then divide mentally.

a. $\frac{5.6}{0.4} = \frac{\quad}{\quad} =$	b. $\frac{4}{0.02} = \frac{\quad}{\quad} =$	c. $\frac{0.9}{0.003} = \frac{\quad}{\quad} =$

6. When 1,200 people were polled about their favorite foods, 320 said they liked mashed potatoes best.

   a. Write a ratio, and simplify it to the lowest terms.

   b. Assuming the same ratio holds true in another group of 150 people, how many of those people can we expect to have mashed potatoes as their favorite food?

7. Fill in the missing numbers to form equivalent rates.

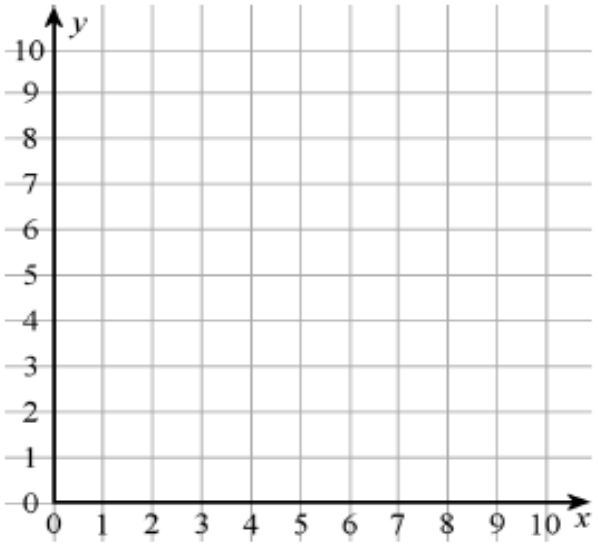
a. $\frac{14\text{ km}}{20\text{ min}} = \frac{\quad}{5\text{ min}} = \frac{\quad}{45\text{ min}}$	b. $\frac{\quad}{8\text{ bottles}} = \frac{\quad}{1\text{ bottle}} = \frac{\$42}{10\text{ bottles}}$

8. You need 2 kg of fertilizer for every 120 m^2 of lawn.
How much fertilizer would you need for a rectangular 15 m by 20 m lawn?

9. Calculate the values of y according to the equation $y = 2x - 4$.

x	2	3	4	5	6	7
y						

Then plot the points.



10. Two-thirds of a stick is 50 cm long.
How long is the whole stick?

11. Marsha has 2 gallons of punch, which she is pouring into 6-oz servings.
How many servings will she be able to get?

12. The children Hannah, 120 cm, and Erica, 1.05 m, stand on stools to see how tall they are.
At what height is the top of their head, if the children stand on stools with the heights of:

a. 3.1 dm

b. 550 mm

c. 45 cm

13. Convert the given distances into metric units. Round the numbers to one decimal place. *Use a calculator* and the conversion factors at the right. →

1 inch = 2.54 cm
1 foot = 0.3048 m
1 mile = 1.6093 km

Every afternoon Erica bicycles 5 miles (_____ km) to the horse ranch.

Erica takes care of a horse that is 15 *hands*, or 60 inches (_____ m), tall.

She likes to go riding on a trail that is 4 mi 500 ft (_____ km) long.

Prime Factorization, GCF, and LCM Review

1. Factor the following numbers into their prime factors.

a. 81 / \	**b.** 26 / \	**c.** 65 / \
d. 96 / \	**e.** 124 / \	**f.** 450 / \

2. Simplify.

a. $\frac{28}{84} = \frac{4 \times 7}{21 \times 4} =$	**b.** $\frac{75}{160} =$
c. $\frac{222}{36} =$	**d.** $\frac{48}{120} =$

3. Find the least common multiple of these pairs of numbers.

a. 3 and 7	**b.** 10 and 8
c. 11 and 6	**d.** 6 and 8

4. Find the greatest common factor of the given number pairs.

a. 24 and 64	**b.** 100 and 75
c. 80 and 96	**d.** 78 and 96

5. Fill in with the words "multiple(s)" or "factor(s)."

- 25, 50, 75, 100, 125, and 150 are _____ of 25.
- 1, 2, 5, 10, 25, and 50 are _____ of 50.
- Each number has an infinite number of _____.
- Each number has a greatest _____.
- If a number x divides into another number y, we say x is a _____ of y.

b. List five different multiples of 15 that are less than 200 but more than 60.

c. Find five numbers that are multiples of both 4 and 7.
What is the LCM of 4 and 7?

6. First, find the GCF of the numbers. Then factor the expressions using the GCF.

a. GCF of 12 and 21 is _____

$12 + 21 =$ ____ $\cdot$ ____ $+$ ____ $\cdot$ ____ $=$ ____ (____ $+$ ____)

b. GCF of 45 and 70 is _____

$45 + 70 =$ ____ (____ $+$ ____)

7. Draw two rectangles, side by side, to represent the sum $42 + 30$.

Prime Factorization, GCF, and LCM Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 23 points. You can give partial points for partial solutions.

Divide the student score by 23 to get a percentage score. For example, if the student scores 17, divide 17 ÷ 23 with a calculator, getting 0.739130... The percentage score is then 74%.

Question #	Max. points	Student score
1	6 points	
2	2 points	
3	2 points	
4	2 points	
5	2 points	

Question #	Max. points	Student score
6	1 point	
7	2 points	
8	4 points	
9	2 points	
TOTAL	23 points	/ 23

Prime Factorization, GCF, and LCM Test

1. Factor the following numbers into their prime factors.

a. 56 / \	b. 90 / \	c. 101 / \

2. Find the least common multiple of these pairs of numbers.

a. 8 and 6	b. 6 and 12

3. Find the greatest common factor of the given number pairs.

a. 98 and 100	b. 98 and 35

4. Find four numbers that are multiples of both 6 and 10.

5. Find the LCM of 8 and 10, and the GCF of 8 and 10, and multiply them. What is the product?

6. Which number is a factor of all numbers?

7. Choose two primes between 10 and 30. What is their greatest common factor?

8. First, find the GCF of the numbers. Then factor the expressions using the GCF.

a. GCF of 24 and 30 is _____

$24 + 30 =$ ____ $\cdot$ ____ $+$ ____ $\cdot$ ____ $=$ ____ (____ $+$ ____)

b. GCF of 22 and 121 is _____

$22 + 121 =$ ____ (____ $+$ ____)

9. Simplify.

a. $\frac{124}{72} =$

b. $\frac{65}{105} =$

Mixed Review 9

1. Solve.

a. $10^4 \cdot 3$	**b.** 7^3	**c.** $10 \cdot 5^3$

2. Write in expanded form using exponents.

a. 109,200

b. 7,002,050

3. Andrew cut a 9-foot board into two pieces that are in a ratio of 3:5.
Find the length of each of the two pieces.

4. Solve by changing each division problem to another, equivalent division problem that can be solved mentally.

a. $\frac{16}{0.4} = \frac{\quad}{\quad} =$	**b.** $\frac{7}{0.007} = \frac{\quad}{\quad} =$	**c.** $\frac{99}{0.11} = \frac{\quad}{\quad} =$

5. Multiply.

a. $100 \times 0.2 =$ _____ $120 \times 0.02 =$ _____	**b.** $3 \times 1.02 =$ _____ $5 \times 3.02 =$ _____	**c.** $0.9 \times 0.2 \times 0.5 =$ _____ $30 \times 0.005 \times 0.2 =$ _____

6. **a.** Draw a bar model to represent this situation:
The ratio of girls to boys in a vocational school is 7:4.

b. What is the ratio of boys to all students?

c. If there are 748 students in all, how many are girls?
How many are boys?

Mixed Review 10

A calculator is allowed only in the last problem.

1. Write as percentages. If necessary, round your answers to the nearest percent.

   a. 4/5

   b. 17/20

   c. 5/11

2. Write the fractions from the previous problem as decimals.

   a. 4/5 = **b.** 17/20 = **c.** 5/11 =

3. A store got a shipment of 155 calculators.
   The ratio of basic calculators to scientific calculators was 4:1.

   a. Draw a model to represent the situation.

   b. What fractional part of the calculators were basic calculators?

   c. What percentage of the calculators were basic calculators?

   d. How many scientific calculators were there?

4. Mike rides his bike at a constant speed of 20 km/h. Fill in the table.

Distance				16 km	20 km	24 km			
Time	6 min	12 min	15 min		1 hour		2 hours	3 hours	3 1/2 hours

5. One flash drive costs $25 and another costs 15% more.
   Find the total cost of buying both.

6. Think of the distributive property "backwards," and factor these sums.

a. $32t + 8 =$ ____ (____ + ____)	**b.** $8 + 12x =$ ____ (____ + ____)
c. $15y + 45 =$ ____ (____ + ____)	**d.** $35 + 42w =$ ____ (____ + ____)

7. Liz is 150 cm tall and her dad is 1.8 m tall. What percentage is Liz's height of her dad's height?

8. The Madison family spent $540 for groceries in one month. That was 24% of their total budget. How much was their total budget for the month?

9. Which is cheaper, a $180 camera discounted by 20%, or a $155 camera discounted by 10%?

10. Multiply using the distributive property.

a. $2(7m + 4) =$	**b.** $10(x + 6 + 2y) =$

11. Write an expression.

a. the quantity $5s$ plus 8, divided by 7

b. the quantity n plus 11, cubed

c. y more than 8

d. x divided by y squared

12. Solve the inequality $x - 3 < 0$ in the set $\{-2, -1, 0, 1, 2, 3\}$.

13. Divide, giving your answer as a decimal. If necessary, round the answers to three decimal digits.

a. $0.928 \div 0.3$	**b.** $\frac{7}{34}$

Fractions Review

1. Add.

a. $\frac{5}{12} + \frac{1}{3}$	b. $\frac{5}{7} + \frac{1}{6}$	c. $1\frac{3}{5} + \frac{7}{8}$

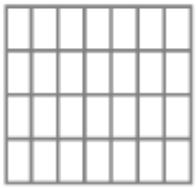
2. Subtract. First write equivalent fractions with the same denominator.

a. $6\frac{2}{3} \rightarrow$ $-\ 2\frac{1}{6} \rightarrow -$ _____ _____	b. $7\frac{1}{6} \rightarrow$ $-\ 2\frac{3}{5} \rightarrow -$ _____ _____	c. $8\frac{9}{11} \rightarrow$ $-\ 4\frac{1}{3} \rightarrow -$ _____ _____

3. The pictures show how much pizza is left. Find the given part of it. Write a multiplication sentence.

a. Find $\frac{3}{4}$ of 	b. Find $\frac{1}{5}$ of 	c. Find $\frac{2}{3}$ of 

4. Multiply. Shade the areas to illustrate the multiplication.

a.  $\frac{1}{4} \times \frac{3}{4} =$	b.  $\frac{3}{4} \times \frac{6}{7} =$

5. Simplify before you multiply.

a. $\frac{9}{12} \times \frac{6}{15}$	b. $\frac{3}{20} \times \frac{4}{21}$	c. $\frac{14}{40} \times \frac{10}{42}$

6. Write a division sentence for each problem and solve.

a. How many times does  go into  ?	b. How many times does  go into  ?

7. Fill in the blanks and give an example. You can choose *any* number to divide by 4.

Dividing a number by 4 is the same as multiplying it by ____. Example:

8. Solve.

a. $\frac{2}{3} \div \frac{1}{5}$	b. $2\frac{1}{7} \div 1\frac{1}{2}$	c. $6 \div 1\frac{2}{3}$

9. A small, rectangular garden plot measures 7 1/2 feet by 4 3/8 feet.

a. Find its area.

b. Find its perimeter.

10. Write a real-life situation to match this fraction division: $\frac{9}{12} \div 3 = \frac{3}{12}$

11. How many 4 1/4 inch-pieces can you cut out of a 10-foot piece of string?

12. A 15-inch stick was cut into two pieces that were in the ratio of 1:7. How long is each of the pieces?

13. A model airplane is built to a scale of 1:15 compared to the real airplane. This means that the lengths, widths, and other measurements of the real airplane are 15 times as big as the corresponding measurements in the model. If the wingspan of the model is 32 1/4 in., what is the wingspan in reality? Give your answer in feet and inches. *(Hint: You can multiply the whole-number part and the fractional part separately.)*

14. In the math class, 5/6 of the students went outside for recess, and 16 stayed in the classroom. How many students are in the whole class?

15. Two-fifths of a certain number is 160. What is the number?

16. Two farmers divided a day's kiwi fruit harvest. One farmer got 2/5 of the harvest and the other farmer got the rest. The farmer who got the least, gave 1/3 of his kiwi to his son, and kept 22 pounds. How many pounds was the day's kiwi fruit harvest?

Puzzle Corner

a. Solve this "long" division!

$$\frac{1}{2} \div 5 \div 4 \div 3 \div 2 =$$

b. What did this division start with?

$$\frac{\square}{\square} \div 3 \div 5 \div 7 \div 9 = \frac{1}{1260}$$

Fractions Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 30 points. You can give partial points for partial solutions.

Divide the student score by 30 to get a percentage score. For example, if the student scores 25, divide 25 ÷ 30 with a calculator, getting 0.833333... The percentage score is then 83%.

Question #	Max. points	Student score
1	8 points	
2	2 points	
3	2 points	
4	2 points	
5	2 points	

Question #	Max. points	Student score
6	2 points	
7	4 points	
8	3 points	
9	2 points	
10	3 points	
TOTAL	30 points	/ 30

Fractions Test

A calculator is not allowed.

1. Add and subtract

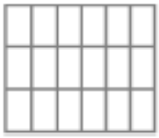
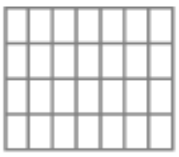
a. $\frac{5}{12} + \frac{1}{2} + \frac{5}{6}$	b. $\frac{5}{9} - \frac{2}{7}$
c. $2\frac{3}{10} + 2\frac{11}{12}$	d. $7\frac{1}{5} - 5\frac{7}{15}$

2. The Williams family had 3/4 of a pizza left over. The next day, Joe ate 3/4 of what was left. What part of the original pizza is left now?

3. How many 1/4-kg servings can you get from 5 1/3 kg of meat?

4. Joe had a board that is 4 1/3 ft. long. He cut it into three equal pieces. How long are the pieces, in feet?

5. Multiply. Shade the areas to illustrate the multiplication.

a.  $\frac{2}{6} \times \frac{2}{3} =$	b.  $\frac{3}{4} \times \frac{5}{7} =$

6. Solve.

a. $\frac{6}{7} \div \frac{1}{5}$	**b.** $\frac{12}{13} \div 2\frac{1}{3}$

7. A room measures 11 feet by 8 3/4 feet, and carpeting it costs $2.80 per square foot. Calculate the cost of carpeting the room.

8. Write a real-life situation to match this fraction division. Also, solve it. $2\frac{1}{2} \div 3 = ?$

9. How many 1 3/4 ft-pieces can you cut out of a 12-foot piece of string?

10. Mason and Aiden divided a $120 reward in a ratio of 2:3. Then, Aiden gave 3/10 of his money to his dad. How much does Aiden have now?

Mixed Review 11

1. **a.** One mile is 5,280 feet. *Estimate* how many inches are in one mile.

   b. Now find out exactly how many inches are in one mile.

2. Jane mixed 2 parts of concentrated juice with 6 parts of water to make a total of 64 ounces of juice. How many ounces of concentrate and how many ounces of water were in the juice?

3. Write the equivalent rates.

a. $\frac{\$80}{4\text{ hr}} = \frac{\quad}{1\text{ hr}} = \frac{\quad}{3\text{ hr}} = \frac{\quad}{15\text{ min}}$	**b.** $\frac{2\text{ m}^2}{5\text{ min}} = \frac{10\text{ m}^2}{\quad} = \frac{\quad}{5\text{ hours}} = \frac{250\text{ m}^2}{\quad}$

4. A mixture of salt and water weighs 1.2 kg. It contains 2% salt, and the rest is water. Find the actual amount of salt and water in the mixture, *in grams*.

5. A train traveled 165 miles from one town to the next at an average speed of 90 mph. When did the train leave, if it arrived at 1440 hours (2:40 P.M.)?

6. Multiply or divide the decimals by the powers of ten.

a.	**b.**	**c.**
$10 \times 0.3909 =$ $1{,}000 \times 4.507 =$	$1.08 \times 100 =$ $0.0034 \times 10^4 =$	$10^6 \times 8.02 =$ $10^5 \times 0.004726 =$
d.	**e.**	**f.**
$0.93 \div 100 =$ $48 \div 10 =$	$3.04 \div 1{,}000 =$ $450 \div 10^4 =$	$98.203 \div 10^5 =$ $493.2 \div 10^6 =$

7. Factor the following numbers into their prime factors.

a. 65 / \	b. 75 / \	c. 82 / \

8. Find a number between 640 and 660 that is divisible by 3 and 7.

9. First, find the GCF of the numbers. Then factor the expressions using the GCF.

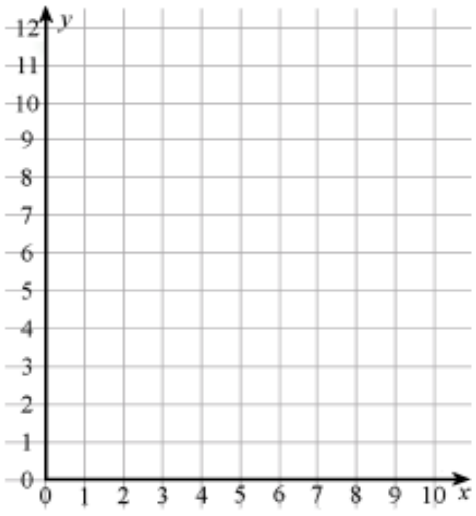
a. GCF of 16 and 42 is _____ 16 + 42 = ____ (____ + ____)	b. GCF of 98 and 35 is _____ 98 + 35 = ____ (____ + ____)

10. Draw two rectangles, side by side, to represent the sum 18 + 30.

11. Calculate the values of y according to the equation $y = 2x - 5$.

x	3	4	5	6	7	8
y						

Now, plot the points.



Mixed Review 12

A calculator is not allowed.

1. Find the least common multiple of these pairs of numbers.

a. 2 and 8	b. 6 and 9

2. Find the greatest common factor of the given number pairs.

a. 14 and 15	b. 48 and 60

3. Draw two rectangles, side by side, to represent the sum 45 + 27.

4. A container of ice cream contains 2 quarts of ice cream.
This is divided equally between 9 people.
How much will each person get (in ounces)?

5. Fill in.

a. 11^2 gives us the _____ of a _____ with a side length of _____ units.

b. 3×5^2 gives us the _____ of _____ _____ with a side length of _____ units.

c. 4×0.4^3 gives us the _____ of _____ _____ with an edge length of _____ units.

6. Write in normal form (as a number).

a. $2 \times 10^7 + 6 \times 10^6 + 2 \times 10^4$	b. $1 \times 10^9 + 2 \times 10^5 + 8 \times 10^2 + 7 \times 10^0$

7. Factor the following numbers into their prime factors.

a. 99 / \	b. 112 / \	c. 200 / \

8. Chris has two kinds of containers for gasoline. The larger ones hold 8.5 liters, and the smaller ones hold 60% of that amount. What is the total capacity of three large and four smaller containers?

9. Samantha and George got paid $100 for working together on a project. Since Samantha had worked 5 hours and George only 3 hours, they decided it would be fair to divide the pay in a ratio of 5:3. How much more did Samantha earn than George?

10. Write an expression.

a. the quotient of 6 and $7s$

b. Subtract $2x$ from 11

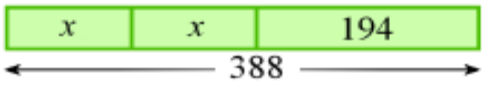
c. the sum of x and 2, squared

d. the quantity $5m$, cubed

e. $2t^2$ divided by the difference between s and 1

f. y less than 18

11. Write an equation to match the bar model, and solve it.



12. Multiply.

a. $4 \times 0.7 =$ _____	c. $3 \times 1.06 =$ _____	e. $10^5 \times 0.08 =$ _____
b. $50 \times 0.003 =$ _____	d. $100 \times 0.009 =$ _____	f. $40 \times 0.004 =$ _____

Integers Review

1. Compare. Write < or > between the numbers.

a. $-1 \square -7$	b. $2 \square -2$	c. $-6 \square 0$	d. $8 \square -3$	e. $-8 \square -3$

2. Order the numbers from the least to the greatest.

a. $-6 \quad 2 \quad -2 \quad 0$	b. $-14 \quad -8 \quad -11 \quad -7$

3. Express the situations using integers. Then compare them using > or < in the box.

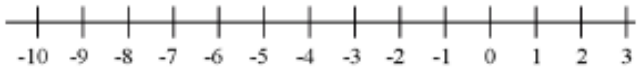
a. Lillian owes $12 and Hayley owes $18.	_____ ☐ _____
b. At 2 PM, the temperature was 5°C below zero. Now it is 2°C.	_____ ☐ _____
c. Joe rose in an elevator to the height of 16 m, whereas Gabriel went down 6 m below the ground.	_____ ☐ _____

4. Simplify. In (e), write using a number.

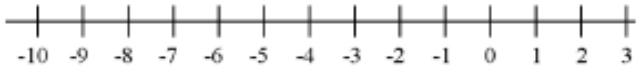
a. $|-11|$ b. $|2|$ c. $|0|$ d. $-(-19)$ e. the opposite of 7

5. Draw a number line jump for each addition or subtraction sentence.

a. $-9 + 6 =$ _____ b. $-2 + 5 =$ _____



c. $-3 - 5 =$ _____ d. $2 - 8 =$ _____



6. Write an addition or subtraction sentence.

a. You are at ¯10. You jump 6 to the right. You end up at _____.

b. You are at ¯5. You jump 8 to the right. You end up at _____.

c. You are at 3. You jump 7 to the left. You end up at _____.

d. You are at ¯11. You jump 3 to the left. You end up at _____.

7. Add and subtract.

a.	b.	c.	d.
$2 + (-8) =$ _____	$-2 + (-9) =$ _____	$1 + (-7) =$ _____	$5 - (-2) =$ _____
$(-2) + 8 =$ _____	$2 - 8 =$ _____	$-4 - 5 =$ _____	$-3 - (-4) =$ _____

8. Write an addition/subtraction sentence to match the situations.

a. May has $35. She wants to purchase a guitar for $85.
That would make her money situation to be _____.

b. A fish was swimming at the depth of 6 ft. Then he sank 2 ft.
Then he sank 4 ft more. Now he is at the depth of _____ ft.

c. Elijah owed his dad $20. Then be borrowed another $10.
Now his balance is _____.

d. The temperature was −13°C and then it rose 5°.
Now the temperature is _____ °C.

_____

_____

_____

_____

9. Use mathematical symbols to express these ideas

a. the distance of −17 from zero

b. the opposite of −11

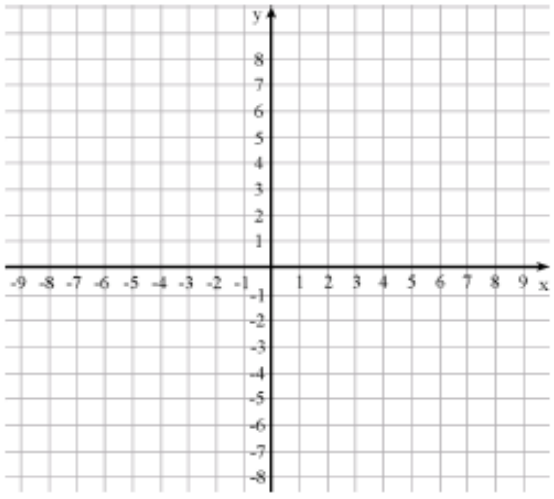
10. Which expression below matches with the situation? Jacob owes more than fifty dollars.

a. balance > −$50 b. balance = −$50 c. balance < $50 d. balance < −$50

11. Plot the points from the function $y = 4 - x$
for the values of x listed in the table.

x	−5	−4	−3	−2	−1	0	1	2
y								

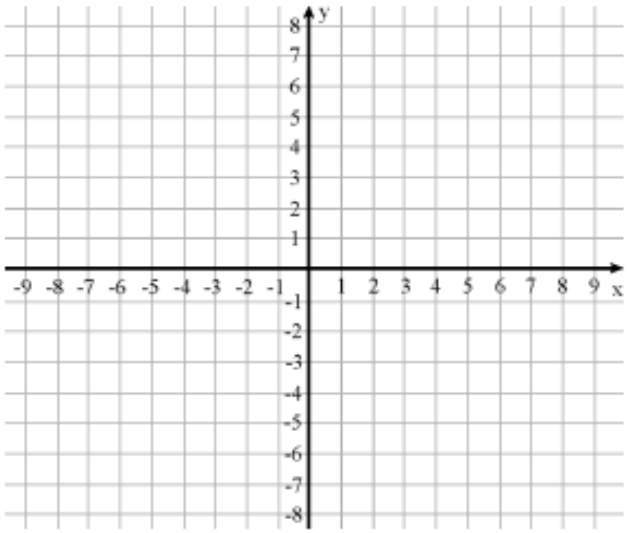
x	3	4	5	6	7	8	9
y							



12. Find the missing integers.

a. $-2 + \_\_\_\_\_ = -8$ $3 + \_\_\_\_\_ = -2$	b. $4 + \_\_\_\_\_ = 0$ $-6 - \_\_\_\_\_ = -12$	c. $5 - \_\_\_\_\_ = -2$ $3 + \_\_\_\_\_ = 1$

13. Andrew drew a polygon, and then he reflected it in the x-axis. The vertices of the reflected polygon are: $(-9, 6)$, $(-6, 6)$, $(-9, 3)$, and $(-3, 0)$. What were the coordinates of the original vertices?

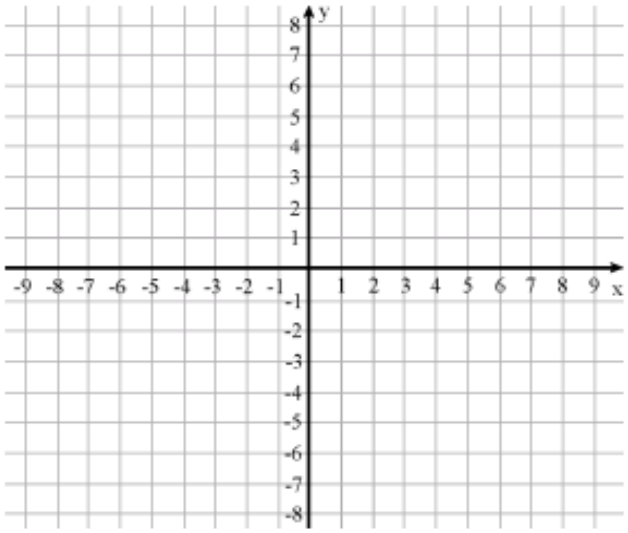


14. Find the distance between the points.

a. $(-3, -12)$ and $(-3, 15)$

b. $(-15, 34)$ and $(-21, 34)$

15. a. The points $(-7, -3)$, $(-1, -7)$, $(-1, -1)$, and $(-4, -6)$ are vertices of a quadrilateral. Draw the quadrilateral.



b. Reflect the quadrilateral in the y-axis. (Draw the new quadrilateral). Write the coordinates of the moved vertices.

$(-7, -3) \rightarrow (\_\_\_\_\_, \_\_\_\_\_)$

$(-1, -7) \rightarrow (\_\_\_\_\_, \_\_\_\_\_)$

$(-1, -1) \rightarrow (\_\_\_\_\_, \_\_\_\_\_)$

$(-4, -6) \rightarrow (\_\_\_\_\_, \_\_\_\_\_)$

c. Now move the already reflected quadrilateral 7 units up. (Draw the new quadrilateral). Write the coordinates of the new vertices.

$(\_\_\_\_\_, \_\_\_\_\_)$ $(\_\_\_\_\_, \_\_\_\_\_)$ $(\_\_\_\_\_, \_\_\_\_\_)$ $(\_\_\_\_\_, \_\_\_\_\_)$

Integers Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 33 points. You can give partial points for partial solutions.

Divide the student score by 33 to get a percentage score. For example, if the student scores 22, divide 22 ÷ 33 with a calculator, getting 0.666666... The percentage score is then 67%.

Question #	Max. points	Student score
1	2 points	
2	4 points	
3	8 points	
4	4 points	

Question #	Max. points	Student score
5	9 points	
6	2 points	
7	4 points	
TOTAL	33 points	/ 33

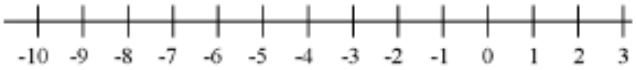
Integers Test

A calculator is not allowed.

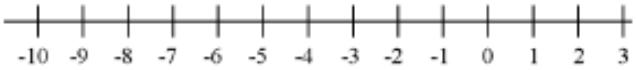
1. Order the numbers 3 −3 −5 0 from the least to the greatest.

2. Draw a number line jump for each addition or subtraction sentence.

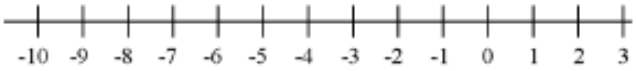
a. −7 + 2 = _____



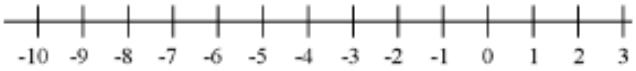
b. −3 + 6 = _____



c. −1 − 5 = _____



d. 2 − 7 = _____



3. Add and subtract.

a.	b.	c.	d.
3 + (−7) = _____	(−1) + (−9) = _____	4 + (−5) = _____	8 − (−2) = _____
(−3) + 7 = _____	1 − 9 = _____	−4 − 5 = _____	−8 − (−2) = _____

4. Use mathematical symbols to express these ideas

a. the distance of −9 from zero

b. the opposite of 43

c. Henry's balance?
He owes some money, less than $20.

d. The temperature is colder than −10.

5. Write an addition or subtraction sentence to match the situations.

a. May owed $3. She borrowed $8 more.
Now her money situation is _____.

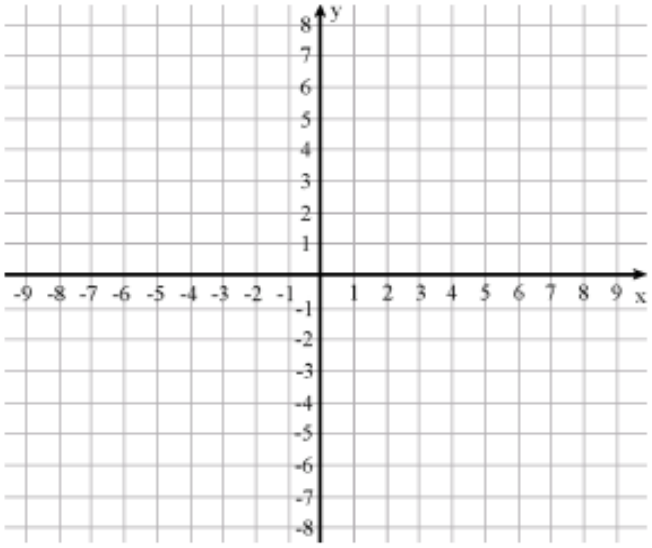
b. The temperature was 1°C and fell 4°.
Now the temperature is _____ °C.

c. A submarine was at the depth of 12 m. Then it rose 5 m.
Then it sank 10 m more. Now it is at the depth of _____ m.

6. Plot the points from the function $y = x - 1$ for the values of x listed in the table.

x	−7	−6	−5	−4	−3	−2	−1	0
y								

x	1	2	3	4	5	6	7	8
y								



7. The points (−7, −6), (−5, −2) , and (−1, −4) are vertices of a triangle.

   a. Draw the triangle.

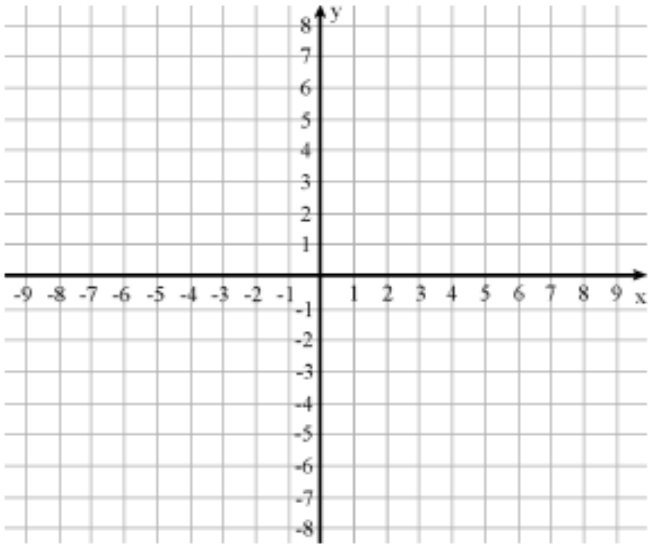
   b. Reflect it in the x-axis. Then move the already reflected triangle 5 units to the right.

   c. Draw the new triangle and write the coordinates of the new vertices.

   (_____ , _____)

   (_____ , _____)

   (_____ , _____)



Mixed Review 13

1. Write an equation for each situation EVEN IF you could easily solve the problem without an equation! Then solve the equation.

   a. Katie is 54 years old. Shelly is 12 years younger than Katie. How old is Shelly?

   b. Bob bought some tulips for his wife. One tulip cost $2.15 The total cost was $45.15. How many tulips did Bob buy?

2. Find a number between 500 and 520 that has only 2s in its prime factorization .

3. Write either a multiplication or a division, and solve.

a. How many times does  go into  ?	b. How many times does  go into  ?
c. Find $\frac{3}{4}$ of 	d. Find $\frac{2}{9}$ of 

4. A package of cheap dominoes weighs 3 oz. A package of quality dominoes weighs 1 lb.

   a. How much does a box containing 50 packages of the cheap dominoes weigh? Give your answer in pounds and ounces.

   b. Another box contains 24 packages of the quality dominoes. Find how much more the box with quality dominoes weighs than the box with cheap dominoes.

5. Divide.

a. $2\frac{7}{8} \div \frac{2}{5}$	**b.** $4 \div 1\frac{5}{6}$
c. $5 \div \frac{2}{7}$	**d.** $10\frac{1}{10} \div \frac{3}{4}$

6. Annabelle can type 70 words in two minutes.
How many words can she type in 15 minutes?

7. Mom's and Dad's ages are in the ratio of 7:8.
Dad is six years older than Mom. How old is Mom?

8. A rectangle's aspect ratio is 5:2, and
its perimeter is 84 cm. Find its area.

9. Keith paid \$414 of his salary in taxes. After that, he had \$1,459 left.
What percentage of his income did Keith pay in taxes?

10. Express these rates in the lowest terms.

a. 720 km : 4 hr	**b.** 6 kg for \$4.20	**b.** 120 miles on 5 gallons

11. Simplify before you multiply.

a. $\frac{5}{36} \times \frac{24}{45}$	**b.** $\frac{16}{30} \times \frac{25}{24}$	**c.** $\frac{14}{25} \times \frac{35}{42}$

Mixed Review 14

A calculator is not allowed.

1. Find the reciprocal.

a. $1\frac{1}{23}$	b. $3\frac{2}{11}$	c. 79	d. 100	e. $\frac{3}{1000}$

2. Divide.

a. $\frac{6}{7} \div \frac{1}{7}$	b. $1\frac{9}{20} \div \frac{3}{20}$	c. $5 \div \frac{1}{3}$	d. $7 \div 1\frac{2}{5}$

3. A sheet of stickers has 48 stickers that each measure 1 1/4 in. by 1 1/4 in. Little Hannah starts to stick them on the front cover of a notebook, side by side. The notebook measures 5 1/2 in. by 8 1/2 in. How many stickers can she fit on the cover?

4. Fill in the table.

Expression	the terms in it	coefficient(s)	Constants
$2x + 3y$			
$0.9s$			
$2a^4c^5 + 6$			
$\frac{1}{6}f$			

5. The table lists the quantities of some of the ingredients for different-sized batches of a certain cake recipe. Fill in the table.

Serves (people)	6	12	18	24	30
butter		1/2 cup			
sugar		1 cup			
eggs		2			
flour		1 1/2 cups			

6. If you make enough cakes for 100 people, how much butter, sugar, eggs, and flour are needed? (You can use the table above.)

7. Find the value of the expressions.

a. $900 - \frac{1}{6} \cdot 72$	b. $23 + 3^4$	c. $\frac{100^3}{100^2}$

8. Marie's age is 4/7 of her brother Tom's age. Tom is 9 years older than Marie. (You can draw a bar diagram to help.)

a. How old is Marie? Tom?

b. What is the ratio of Marie's age to Tom's age?

9. Write an expression for both the **area** *and* **perimeter** of each shape, in simplified form.

a. A =

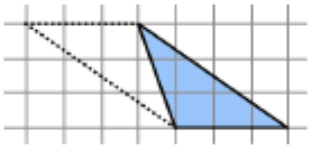
P =

b. A =

P =

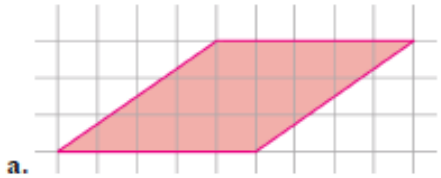
Geometry Review

1. Explain how the area of a triangle is related to the parallelogram.



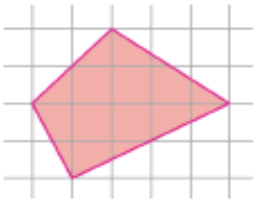
2. Find the area of the quadrilaterals in square units.

a.



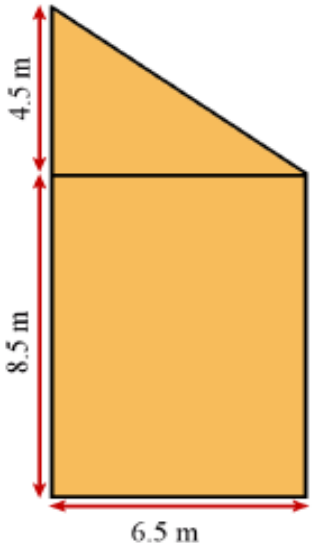
A = _____

b.



A = _____

3. a. Find the area of Jeremy's garden.

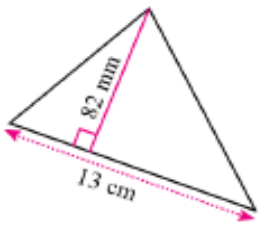


b. Jeremy planted a rectangular section measuring 3.5 m by 3 m with green beans. What percentage of his garden did he plant with green beans?

4. Find the area of this triangle:

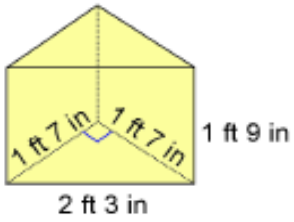
a. in square centimeters

b. in square millimeters

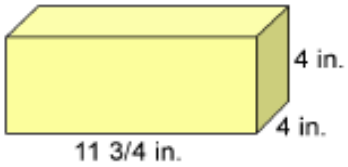


5. Draw a net and calculate the surface area

a.

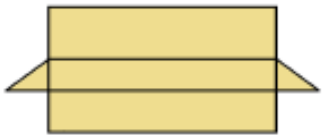


b.

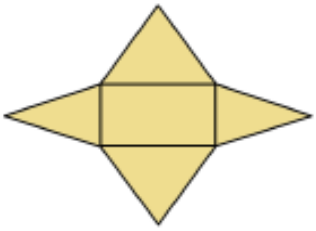


6. What solids can be constructed from these nets?

a.



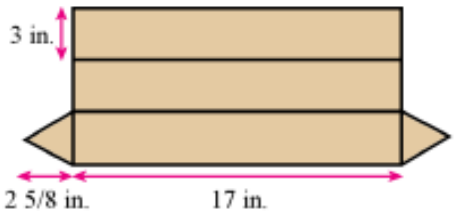
b.



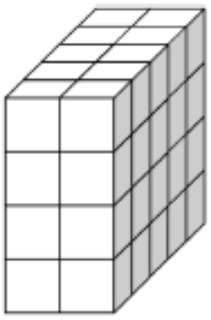
c.

7. What solid can you build from this net?

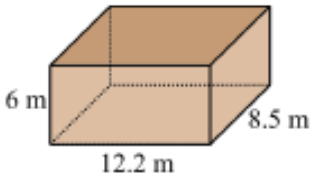
Calculate its surface area.



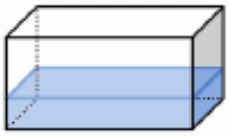
8. The edges of each little cube measure 1/3 m. What is the total volume of this figure, in cubic meters?



9. This building has three stories. Calculate the volume of one story.



10. An aquarium measures 50 cm × 30 cm on the bottom, and its height is 40 cm. It is 4/5 filled with water.



How many cubic centimeters of water is in it?

How many milliliters of water is in it?
(One cubic centimeter is one milliliter.)

How many liters?

Geometry Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 26 points. You can give partial points for partial solutions.

Divide the student's score by 26 to get a percentage score. For example, if the student scores 21, divide 21 ÷ 26 with a calculator, getting 0.80769230... The percentage score is then 81%.

Question #	Max. points	Student score
1	4 points	
2	3 points	
3	4 points	
4	3 points	
5	2 points	

Question #	Max. points	Student score
6	2 points	
7	4 points	
8	2 points	
9	2 points	
TOTAL	26 points	/ 26

Geometry Test

A calculator is not allowed.

1. Measure what you need from the shape, and find its area . . .
   a. in square centimeters, to the nearest square centimeter

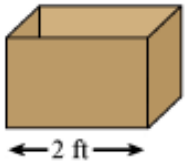
   b. in square millimeters, to the nearest hundred square millimeters

2. Find the area of the quadrilateral in square units.

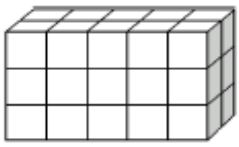
3. a. What is this shape called?

   b. Find its area.

4. The dimensions of this box are 2 ft × 1.5 ft × 1.5 ft. What is the total area of the bottom and side faces of the box (ie. not including the top)?



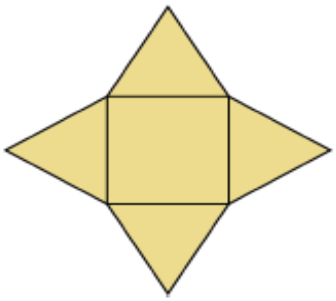
5. The edges of each little cube measure 1/4 in.
What is the total volume of the figure?



6. A book about how to raise ducks measures 6 1/2 in. × 8 in. × 3/8 in.
What is the volume of one book?

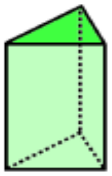
7. a. What solid can be built from this net?

b. Calculate its surface area, if each side of the bottom square measures 5 in. and the height of each triangle is 4 1/8 in.

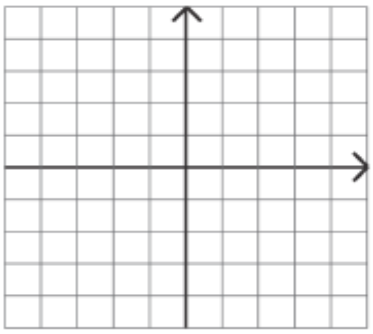


8. What is this solid called?

Sketch its net.



9. The vertices of a triangle are
(1, 0), (2, −4) and (−3, −3).
Find the area of the triangle.



Mixed Review 15

1. The family put 1/3 of 60 pounds of flour into the cellar.
   Then, they gave 3/8 of the remaining flour to a neighbor.
   How much flour did the neighbor get?

2. Multiply.

a. $3 \times 0.3 \times 0.08 =$ _____	**b.** $7 \times 0.2 \times 1.1 =$ _____	**c.** $0.25 \times 10^5 =$ _____
d. $0.0009 \times 8 =$ _____	**e.** $0.002 \times 100 =$ _____	**f.** $3000 \times 0.0007 =$ _____

3. Order the fractions from the smallest to the biggest.

a. $\frac{5}{6}, \frac{8}{10}, \frac{7}{8}, \frac{9}{10}, \frac{7}{10}$ ____ < ____ < ____ < ____ < ____	**b.** $\frac{9}{8}, \frac{11}{10}, \frac{7}{6}, \frac{12}{10}, \frac{10}{8}$ ____ < ____ < ____ < ____ < ____

4. Convert the measurements into the given units.

   a. 0.9 L = _____ dl = _____ cl = _____ ml

   b. 2,800 m = _____ km = _____ dm = _____ cm

   c. 56 g = _____ dg = _____ cg = _____ mg

5. Convert. Round your answers to 2 decimals in (a) - (d). In (e) and (f) use whole numbers.

a. 76 oz = _____ lb	**c.** 3.6 gal = _____ qt	**e.** 2.67 mi = _____ ft
b. 98 in = _____ ft	**d.** 0.483 lb = _____ oz	**f.** 5.09 ft = _____ ft _____ in

6. Use ratios to convert the measuring units. 1 kg = 2.2 lb, and 1 in. = 2.54 cm.

a. 134 kg into pounds
b. 156 in. into centimeters

7. Solve the equations.

a. $0.2m = 6$	**b.** $0.3p = 0.09$	**c.** $y - 1.077 = 0.08$

8. **a.** Draw a picture where there are 2 triangles for each 5 squares, and a total of 21 shapes.

b. The unit rates are:

_____ squares for 1 triangle

_____ triangles for 1 square

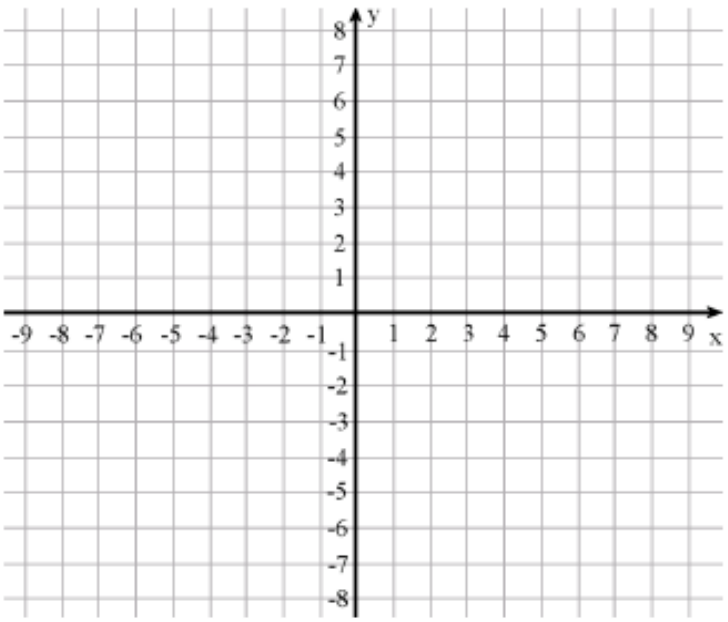
9. Add and subtract.

a. $5 + (-8) =$ _____	**b.** $-11 + (-9) =$ _____	**c.** $2 + (-17) =$ _____	**d.** $2 - (-8) =$ _____
$(-5) + 8 =$ _____	$9 - 11 =$ _____	$-3 - 8 =$ _____	$-8 - (-2) =$ _____

10. A figure whose vertices are at $(-5, -3)$, $(-1, -3)$, $(0, -5)$, and $(-7, -5)$ is transformed this way:

1. It is reflected in the x-axis.
2. It is moved four units to the right, five down.
3. It is reflected in the y-axis.

Give the coordinates of its vertices after all three transformations.

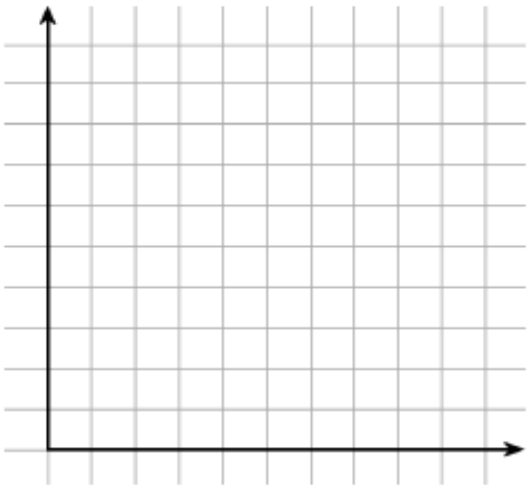


11. Draw a triangle whose vertices are at $(-3, -4)$, $(5, -4)$, and $(2, 7)$.

Draw an altitude to the triangle.

Find its area.

12. A mole is digging a tunnel at the speed of 4 m per hour.



a. Choose two variables (letters) to represent the *time* mole has dug and *the amount of tunnel* it has dug (distance).

b. Fill in the table. Plot the points.

time (hours)	0	1	2	3	4	5	6	7	8	9
distance (meters)										

c. Write an equation relating the two variables.

d. Which is the independent variable?

13. Fill in the blank and give an example.

a. Dividing a number by 5 is the same as multiplying it by ____. Example:

b. Dividing a number by $\frac{2}{3}$ is the same as multiplying it by ____. Example:

14. Write as percentages. If necessary, round your answers to the nearest percent.

a. 5/8

b. 6/25

15. Draw a triangle with 55° and 29° angles, and a 6-cm side between those angles.

16. Draw a rhombus with 7.5 cm sides, and one 66° angle.

Puzzle Corner

Find the missing factors.

a. $\frac{1}{5} \times \quad = \frac{1}{20}$

b. $\frac{1}{5} \times \quad = 2$

c. $\frac{5}{6} \times \quad = \frac{1}{3}$

Mixed Review 16

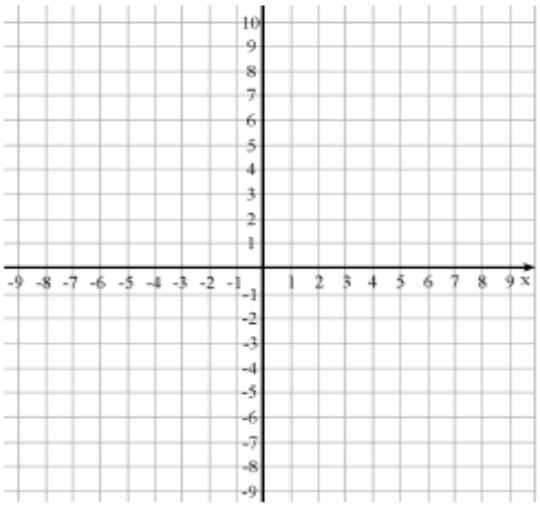
A calculator is not allowed.

1. Move these points four units to the *left*:

   $(-5, 1) \rightarrow (\_\_\_\_, \_\_\_\_)$

   $(-2, -3) \rightarrow (\_\_\_\_, \_\_\_\_)$

   $(3, -7) \rightarrow (\_\_\_\_, \_\_\_\_)$



2. Sam and Matt divided a salary of $180 in a ratio of 4:5. Calculate how much each boy got.

3. Find the greatest common factor of the given number pairs.

a. 56 and 70	b. 96 and 36

4. Find five numbers that are multiples of both 5 and 9.

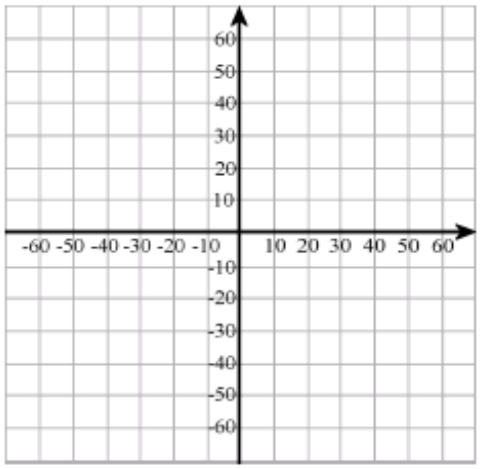
5. Solve the equations by thinking logically.

a. $4 \times \_\_\_\_\_ = 0.0012$	b. $0.2 \times \_\_\_\_\_ = 0.06$	c. $0.03 \times \_\_\_\_\_ = 30$

6. Solve the equations.

a. $0.5x = 30$	b. $0.01x = 2$	c. $c + 1.1097 = 3.29$

7. The grid represents a board game.
Samantha has game pieces at (−50, 40) and (−50, −25).



a. How far apart are Samantha's two game pieces from each other?

b. Hailey guessed, "Your game piece is at (10, 40)."
Samantha said, "You missed by _____ units!"

c. Originally, Samantha had 6 game pieces in the game.
What percentage of game pieces does she have left?

8. Find the better deal: an $18 flash drive is discounted by 15%, and another, $20 flash drive is discounted by 1/5.

9. Alice had a box of 90 oranges. She gave 3/5 of the oranges to Beatrice.
Then, of what was left, she gave 1/4 to Michael.
How many oranges does Alice have now?
How many oranges did Michael get?

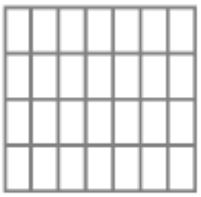
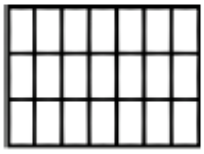
10. Asphalt paving costs $1,250 for 500 square feet. Fill in the equivalent rates.

$$\frac{\quad}{100 \text{ sq. ft.}} = \frac{\quad}{200 \text{ sq. ft.}} = \frac{\quad}{500 \text{ sq. ft.}} = \frac{\quad}{2{,}000 \text{ sq. ft.}} = \frac{\quad}{2{,}400 \text{ sq. ft.}}$$

11. Add and subtract.

a. $-2 + (-11) =$ _____ $(-11) + 2 =$ _____	**b.** $-1 + (-7) =$ _____ $1 - 7 =$ _____	**c.** $10 - 17 =$ _____ $-10 - 17 =$ _____	**d.** $7 - (-3) =$ _____ $-3 - (-7) =$ _____

12. Multiply, and shade the grid to illustrate the multiplications.

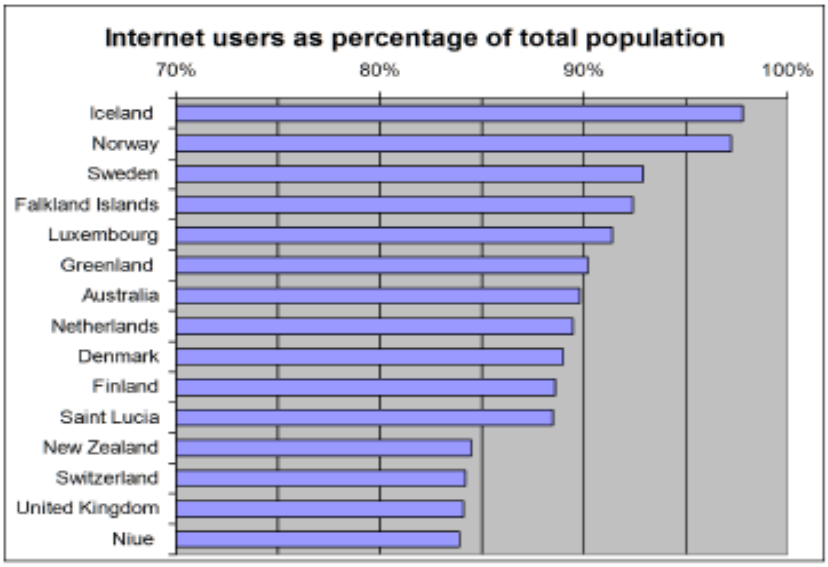
a.  $\frac{4}{7} \times \frac{3}{4} =$	**b.**  $\frac{1}{7} \times \frac{2}{3} =$

Statistics Review

1. Is it a statistical question? If not, change the question so that it becomes a statistical question.

   a. Which kind of books do the visitors of this library like the best?

   b. How many pages are in the book *How to Solve It* by G. Polya?



Source: InternetWorldStats.com

2. Fill in, using estimated percentages from the graph. In (c) and (d), round to the nearest tenth of a million.

   a. About _____% of the population of Norway use the Internet.

   b. About _____% of the population of United Kingdom use the Internet.

   c. The population of Netherlands was about 16,847,000 when these statistics were gathered (2011).

   So, there are about _____ million internet users in Netherlands.

   d. The population of Finland was about 5,260,000 when these statistics were gathered (2011).

   So, there are about _____ million internet users in Finland.

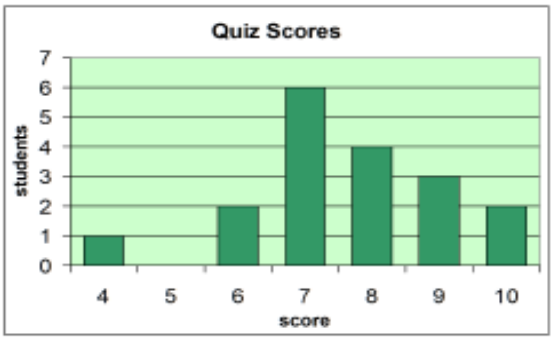
3. a. Find the mean, median, and mode.
   Hint: recreate the list of the original data.

   Mean:

   Median:

   Mode:

   b. We notice this distribution has a *gap* at 5. What else can you say about the shape of the distribution?



4. **a.** Find the five-number summary and the interquartile range of this data set, and make a boxplot.

2, 5, 5, 6, 6, 7, 7, 7, 8, 8, 8, 9, 12

minimum _____

1st quartile _____

median _____

3rd quartile _____

maximum _____

interquartile range _____

b. What could this data be?

5. **a.** Make a stem-and-leaf plot of this data.

78 82 84 75 90 66 77 64 112 84 85

(The height of a group toddlers, in centimeters.)

Stem	Leaf

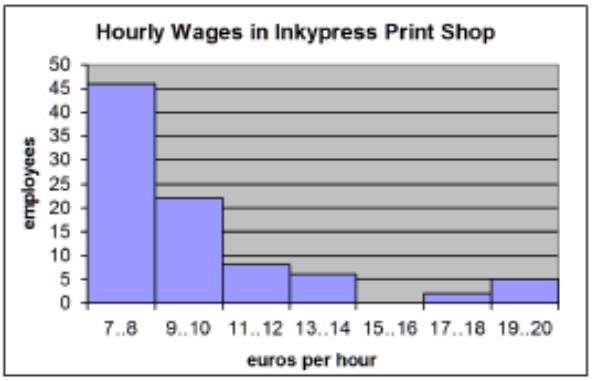
b. Find the median.

c. Find the range.

d. The data set has an outlier.
Which number is the outlier?

e. Describe the spread of the data.

6. This graph shows the hourly wages in euros per hour of the 89 employees in the Inkypress Print Shop.



a. About what fraction of the people earn 7-8 euros/hour?

b. Describe the shape of the distribution.

c. The mean is 9.66 euros/hour and the median is 8 euros/hour. Which is better in describing the majority's wages in this print shop?

7. **a.** Create a dot plot from this data.

b. Describe the spread of the data.

c. Describe the shape of the distribution.

d. Choose a measure of center to describe the data, and determine its value.

e. Create a histogram. Make four bins.

California Cities Precipitation

City	Average Annual Rainfall (in)
Bishop	5
Bakersfield	6
San Diego	11
Fresno	11
Long Beach	13

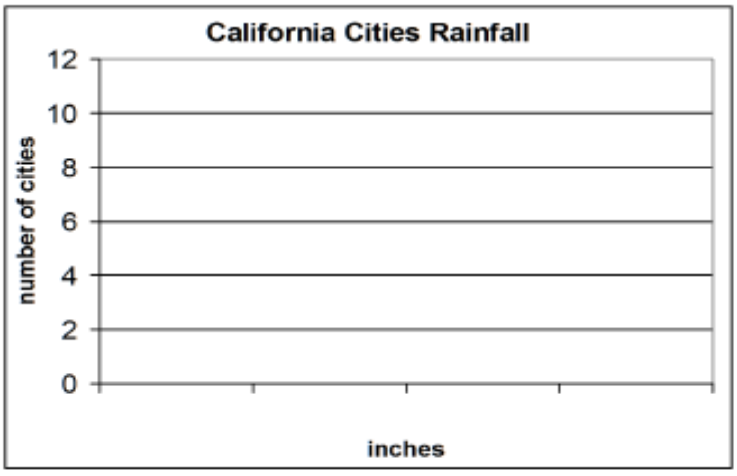
City	Average Annual Rainfall (in)
Los Angeles	13
San Francisco	13
Stockton	14
Santa Maria	14
Santa Barbara	17

City	Average Annual Rainfall (in)
Sacramento	18
Redding	34
Eureka	38
Mount Shasta	39
Blue Canyon	68

Dot plot:

Histogram:

Rainfall (in)	Frequency



Statistics Test

A calculator is not allowed. My suggestion for grading is as follows. The total is 25 points. You can give partial points for partial solutions.

Multiply the student's score by 4 to get a percentage score. For example, if the student scores 21, multiply 4 × 22 = 88. The percentage score is then 88%.

Question #	Max. points	Student score
1	8 points	
2a	2 points	
2b	2 points	
2c	2 points	
2d	1 point	

Question #	Max. points	Student score
3a	3 points	
3b	1 point	
3c	1 point	
4	5 points	
TOTAL	25 points	/ 25

Statistics Test

A calculator is allowed.

1. Calculate the mean, median, mode, and range—if possible—for these data sets.

   a. 12, 15, 11, 18, 20, 15, 16

   mean _____ median _____ mode _____ range _____

   b. duck, cow, horse, horse, horse, cat, cat, dog, dog, dog

   mean _____ median _____ mode _____ range _____

2. The following are the points for two math quizzes for a 7th grade class.

   a. Make bar graphs from the data.

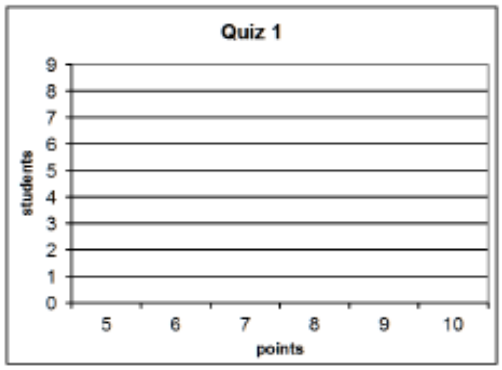
   b. Describe the shape of each distribution.

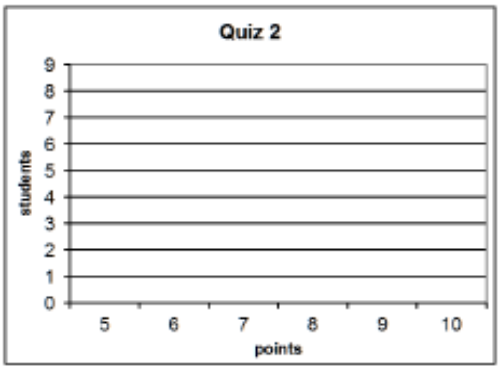
   c. Choose a measure of center to describe the distributions, and determine its value for both quizzes.

   d. Which quiz went better overall?

Quiz 1	
Points	Students
5	7
6	8
7	6
8	3
9	0
10	0

Quiz 2	
Points	Students
5	1
6	2
7	5
8	8
9	5
10	3





Quiz 1:

Shape of the distribution: _____

_____

measure of center: _____

Quiz 2:

Shape of the distribution: _____

_____

measure of center: _____

3. **a.** Make a stem-and-leaf plot of this data.

114 128 132 127 122 127 130 119 120 121 125
(Results of a high jump contest boys, in centimeters)

Stem	Leaf

b. Find the median.

c. What is the interquartile range?

4. Make a boxplot from this data:

89 92 95 96 99 103 105 106 106 109 109 110 112 114 117 118 124

(birth weight in grams of Momma Cat's three litters of kittens)

Mixed Review 17

1. Find the greatest common factor of the given number pairs.

   a. 87 and 36 **b.** 96 and 16

2. Find the least common multiple of the given number pairs.

   a. 6 and 12 **b.** 8 and 12

3. First, find the GCF of the numbers. Then factor the expressions using the GCF.

a. GCF of 72 and 12 is _____ 12 + 72 = ____ (____ + ____)	**b.** GCF of 42 and 66 is _____ 42 + 66 = ____ (____ + ____)

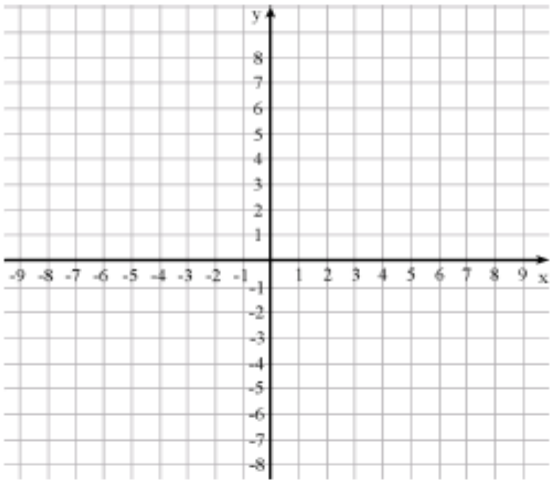
4. **a.** The points (−8, 7), (−5, 3) , and (4, 0) are vertices of a triangle. Draw the triangle.

   b. Move the triangle five units down *and* three units to the right. Notice there are *two* movements! Write the coordinates of the moved vertices.

   (−8, 7) → (_____ , _____)

   (−5, 3) → (_____ , _____)

   (4, 0) → (_____ , _____)



5. Write an equation for each situation EVEN though you could easily solve the problem without an equation! Lastly, *solve* the equation you wrote.

a. The area of a rectangle is 304 m^2 and one of its sides is 19 m. How long is the other side?

b. Mike weighed five identical books on the scale. They weighed 6.7 kg. What was the weight of one book?

6. Simplify the expressions.

a. $z \cdot z \cdot z \cdot 7$	**b.** $8 \cdot a \cdot 3 \cdot b \cdot 10$
c. $2 + x + x + x + x$	**d.** $5t - 2t + 6$

7. Add and subtract the fractions. Give your answer as a mixed number.

a. $\frac{5}{11} + \frac{1}{2} + \frac{5}{6}$

b. $3\frac{11}{12} - \frac{5}{10} + \frac{1}{4}$

8. What part of the whole pizza is two-thirds of nine-tenths of a pizza?

9. A piglet is born weighing 3 lb 4 oz. If it gains approximately 7 1/3 ounces per day during its 12-day nursing period, then how much will it weigh at weaning (the end of the nursing period)?

10. A string that is 5 3/4 inches long is cut into four equal pieces. How long are the pieces?

11. Simplify. In (e), write using a number.

a. $|9|$ **b.** $|-3|$ **c.** $|0|$ **d.** $-(-28)$ **e.** the opposite of -7

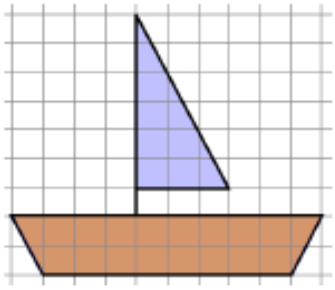
12. Write an addition or subtraction sentence.

a. You are at $^{-}12$. You jump 7 steps to the right. You end up at _____.

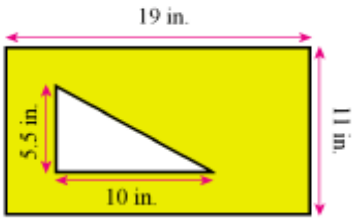
b. You are at 2. You jump 8 steps to the left. You end up at _____.

13. On a blank paper, draw a right triangle with an *area* of 8 square inches.

14. Find the total area of the boat and its sail.

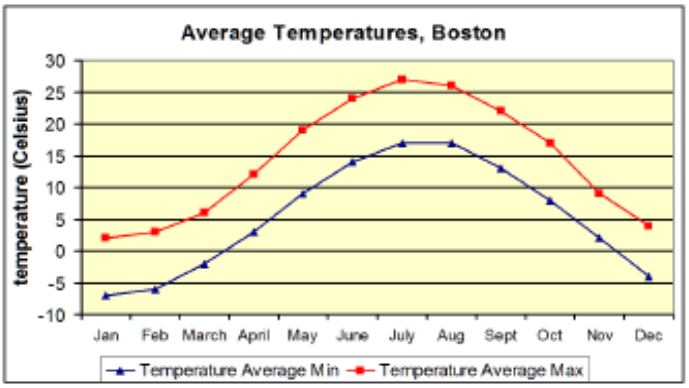


15. Find the area of the yellow shaded figure at the right.



16. **a.** Name the three warmest and the three coldest months in Boston.

b. Now look at the maximum temperatures. What is the temperature difference between the coldest and the warmest month?



c. About how much is the difference in maximum and minimum temperatures in August?

In January?

Puzzle Corner Be a teacher-detective: how did the kids come up with these answers?

a. Jerry cannot figure out what went wrong:

$\frac{2}{7} \div 1\frac{3}{4} = 6\frac{1}{8}$

$2\frac{1}{3} \div \frac{2}{5} = \frac{6}{35}$

$1\frac{1}{5} \div 2\frac{2}{3} = 2\frac{2}{9}$

What error did Jerry make each time?

b. Emily has something fishy going on here:

$\frac{4}{5} \div 1\frac{1}{2} = 1\frac{3}{5}$

$2\frac{1}{3} \div \frac{1}{4} = 1\frac{1}{3}$

$1\frac{1}{5} \div 2\frac{2}{3} = \frac{3}{10}$

What error did Emily make each time?

Mixed Review 18

A calculator is not allowed.

1. Find the perimeter and the area of this triangle.

2. The distance from Ben's home to his workplace is only 0.7 miles.

   a. What is it in feet?

   b. Ben walks to work 4/5 of his workdays, and the rest of the time he rides a bike. Calculate how many miles he ends up walking in a year going to work. Assume that he works 48 weeks in a year, 5 days a week.

3. Convert the measurements into the given units.

	m	dm	cm	mm
a. 7.82 m	7.82			
b. 109 mm				109 mm

4. Divide, and give your answer as a decimal. If necessary, round the answers to three decimal digits.

a. $17.54 ÷ 3	b. 2.4 ÷ 0.05

5. **a.** What is the volume of a shoe box measuring 25 cm by 18 cm by 12 cm?

b. Sketch the net of the shoe box.

c. Calculate the surface area of the shoe box.

6. Write an expression.

a. 5 less than x to the 5th power

b. the quantity 2 minus x, cubed

c. 2 times the sum of 10 and y

d. the difference between s and 2, divided by s squared

7. Find the value of the expression in 6a above, if x has the value 2.

8. Factor these sums (writing them as products).

a. $56x + 14 =$ ____ (____ + ____)	**b.** $18u + 60 =$ ____ (____ + ____)

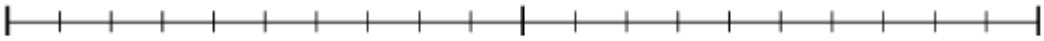
9. Solve the equations.

a. $y \div 50 = 60 \cdot 2$ $=$ $=$ $=$	**b.** $3x - x = 3 + 7$ $=$ $=$ $=$	**c.** $7x = 50$ $=$ $=$ $=$

10. Solve the inequality $x - 12 > 6$ in the set {11, 13, 15, 17, 19, 21, 23}.

11. Mark the following numbers on this number line that starts at 0 and ends at 2.

$$0.3,\ \frac{5}{4},\ 0.45,\ 1.25,\ \frac{3}{5},\ 1.07,\ 1\frac{3}{10},\ 1.95,\ \frac{1}{3}$$



12. Write these fractions as decimals. Give your answers to three decimal digits.

a. $\frac{5}{4} =$	**b.** $\frac{6}{7} =$	**c.** $\frac{19}{16} =$

13. A puzzle measures 8 1/2 inches by 10 inches. Calculate the area of the puzzle in square centimeters, using the fact that 1 inch = 2.54 cm.

14. Oats cost $0.92 per pound. Eric bought 2 3/4 lb. Calculate the total cost of Eric's purchase.

15. Make a stem-and-leaf plot from the following data:

heart rates of a group of 13-year olds after doing jumping jacks for 30 seconds:

159 162 145 175 155 163 160 140 158 190 172 162 152 163 148 150

End-of-the-Year Test

Basic Operations

1. Two kilograms of ground cinnamon is packaged into bags containing 38 g each. There will also be some cinnamon left over. How many bags will there be?

2. Write the expressions using an exponent. Then solve.

   a. $2 \times 2 \times 2 \times 2 \times 2$

   b. five cubed

   c. ten to the seventh power

3. Write in normal form (as a number).

   a. $7 \times 10^7 + 2 \times 10^5 + 9 \times 10^0$

   b. $3 \times 10^8 + 4 \times 10^6 + 5 \times 10^5 + 1 \times 10^2$

4. Round to the place of the underlined digit.

   a. $6,299\underline{,}504 \approx$ _____ **b.** $6,609,\underline{9}42 \approx$ _____

Expressions and Equations

5. Write an expression.

   a. 2 less than s

   b. the quantity $7 + x$, squared

   c. 5 times the quantity $y - 2$

   d. the quotient of 4 and x^2

6. Evaluate the expressions when the value of the variable is given.

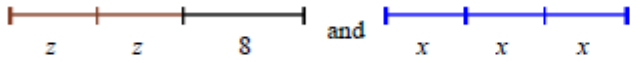
a. $40 - 8x$ when $x = 2$	**b.** $\frac{65}{p} \cdot 3$ when $p = 5$

7. Write an expression for each situation.

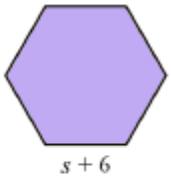
a. You bought m yogurt cups at \$2 each and paid with \$50. What is your change?

b. the area of a square with the side length s

8. Write an expression for the total length of the line segments, and simplify it.



9. Write an expression for the perimeter of the figure, and simplify it.



10. Write an expression for the area of the figure, and simplify it.

11. Simplify the expressions.

a. $9x - 6x$	b. $w \cdot w \cdot 7 \cdot w \cdot 2$

12. Multiply using the distributive property.

a. $7(x + 5) =$	b. $2(6p + 5) =$

13. Find the missing number in the equations.

a. ____ $(6x + 5) = 12x + 10$	b. $5(2h +$ ____ $) = 10h + 30$

14. Solve the equations.

a. $\frac{x}{31} = 6$	b. $a - 8.1 = 2.8$

15. Which of the numbers 0, 1, 2, 3 or 4 make the equation $\frac{8}{y^2} = 2$ true?

16. Write an equation EVEN IF you could easily solve the problem without an equation! Then solve the equation.

The value of a certain number of quarters is 1675 cents. How many quarters are there?

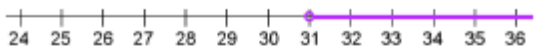
17. Write an inequality for each phrase. You will need to choose a variable to represent the quantity in question.

a. Eat at most 5 pieces of bread.

b. You have to be at least 21 years of age.

18. Write an inequality that corresponds to the number line plot.

a.



b.

19. A car is traveling with a constant speed of 80 kilometers per hour. Consider the variables of time (t), measured in hours, and the distance traveled (d), measured in kilometers.

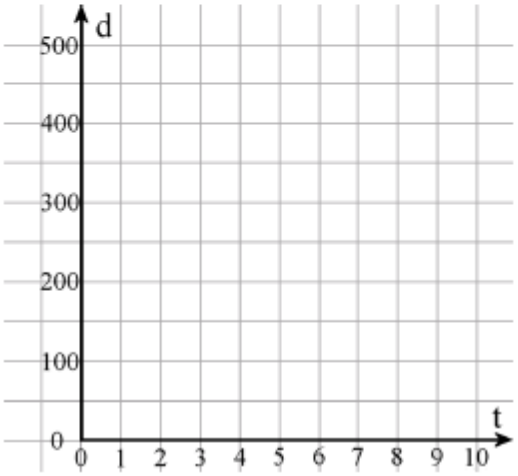
a. Fill in the table.

t (hours)	0	1	2	3	4	5	6
d (km)							

b. Plot the points on the coordinate grid.

c. Write an equation that relates t and d.

d. Which of the two variables is the independent variable?



Decimals

20. Write as decimals.

a. 13 millionths **b.** 2 and 928 ten-thousandths

21. Write as fractions or mixed numbers.

a. 0.00078 **b.** 2.000302

22. Find the value of the expression $x + 0.07$ when x has the value 0.0002.

23. Calculate mentally.

a. $0.8 \div 0.1 =$	**b.** $0.06 \times 0.008 =$

24. **a.** Estimate the answer to 7.1×0.0058.

b. Calculate the exact answer.

25. What number is 22 ten-thousandths more than 1 1/2?

26. Multiply or divide.

a. $10^5 \times 0.905 =$	**b.** $24 \div 10^4 =$

27. Divide, and give your answer as a decimal. If necessary, round the answers to three decimal digits.

a. $175 \div 0.3$	**b.** $\frac{2}{9}$

28. Annie bought 3/4 kg of cocoa powder, which cost $12.92 per kg.

a. Estimate the cost.

b. Find the exact amount she had to pay.

29. Alyssa and Anna bought three toy cars for their three cousins from a store on line. The price for one car was $3.85. A shipping fee of $4.56 was added to the total cost. The two girls shared the total cost equally. How much did each girl pay?

Measuring Units *A calculator is allowed in this section.*

1 mile = 5,280 feet 1 mile = 1,760 yards	1 ton = 2,000 lb 1 lb = 16 oz	1 gal = 4 qt 1 qt = 2 pt 1 pt = 16 fl. oz

30. Convert to the given unit. Round your answers to two decimals, if needed.

a. 178 fl. oz. = _____ qt	**b.** 0.412 mi. = _____ ft	**c.** 1.267 lb = _____ oz

31. How many miles is 60,000 inches?

32. A big coffee pot makes 2 quarts of coffee.
How many 6-ounce servings can you get from that?

33. A pack of 36 milk chocolate candy bars costs $23.20. Each bar weighs 1.55 oz.
Calculate how much one pound of these chocolate bars would cost (price per pound).

34. Convert the measurements. You can write the numbers in the place value charts to help you.

a. 39 dl = _____ L **b.** 15,400 mm = _____ m

c. 7.5 hm = _____ cm **d.** 597 hl = _____ L

e. 7.5 hg = _____ kg **f.** 32 g = _____ cg

kl	hl	dal	l	dl	cl	ml
kg	hg	dag	g	dg	cg	mg
km	hm	dam	m	dm	cm	mm

35. **a.** One brick is 215 mm long. How many of these bricks, put end to end, will cover a 5.15 meter wall?

b. Calculate the answer to the previous question again, assuming 1 cm of mortar is laid between the bricks.

Ratio

36. **a.** Draw a picture where there are a total of ten squares, *and* for each two squares, there are three triangles.

b. Write the ratio of squares to all triangles, and simplify this ratio to the lowest terms.

37. Write ratios of the given quantities. Then, simplify the ratios. You will need to *convert* one quantity so it has the same measuring unit as the other.

a. 3 kg and 800 g	**b.** 2.4 m and 100 cm

38. Express these rates in the lowest terms.

a. \$56 : 16 kg	**b.** There are six teachers for every 108 students.

39. Change to unit rates.

a. \$20 for five T-shirts	**b.** 45 miles in half an hour

40. **a.** It took 7 hours to mow four equal-size lawns. At that rate, how many lawns could be mowed in 35 hours? You can use the table below to help.

Lawns					
Hours					

b. What is the unit rate?

41. Joe and Mick also worked on a project unequally. They decided to divide their pay in a ratio of 3:4 (3 parts for Joe, 4 parts for Mick). The total pay was \$180. Calculate how much Mick got.

42. Use the given ratios to convert the measuring units. If necessary, round the answers to three decimal digits.

a. Use $1 = \frac{1.6093\ \text{km}}{1\ \text{mi}}$ and convert 7.08 miles to kilometers.
7.08 mi =
b. Use $1 = \frac{1\ \text{qt}}{0.946\ \text{L}}$ and convert 4 liters to quarts.
4 L =

Percentage

43. Write as percentages, fractions, and decimals.

a. _____% = $\frac{35}{100}$ = _____	b. 9% = $\frac{\square}{\square}$ = _____	c. _____% = $\frac{\square}{\square}$ = 1.05

44. Fill in the table, using mental math.

	510
1% of the number	
5% of the number	
10% of the number	
30% of the number	

45. A pair of roller skates is discounted by 40%. The normal price is $65.
What is the discounted price?

46. A store has sold 90 notebooks, which is 20% of all the notebooks they had.
How many notebooks did the store have at first?

47. Janet has read 17 of the 20 books she borrowed from the library.
What percentage of the books she borrowed has she read?

Prime Factorization, GCF, and LCM

48. Find the prime factorization of the following numbers.

a. 45 / \	b. 78 / \	c. 97 / \

49. Find the least common multiple of these pairs of numbers.

a. 2 and 8	b. 9 and 6

50. Find the greatest common factor of the given number pairs.

a. 30 and 16	b. 45 and 15

51. List three different multiples of 28 that are more than 100 and less than 200.

52. First, find the GCF of the numbers. Then factor the expressions using the GCF.

a. GCF of 18 and 21 is _____ 18 + 21 = ____ · ____ + ____ · ____ = ____ (____ + ____)
b. GCF of 56 and 35 is _____ 56 + 35 = ____ (____ + ____)

Fractions

53. Solve.

a. $\frac{4}{5} \div \frac{1}{5}$	**b.** $3\frac{1}{8} \div 1\frac{1}{2}$	**c.** $4 \div \frac{5}{7}$

54. Write a division sentence, and solve.

How many times does  go into  ?

55. Write a real-life situation to match this fraction division: $1\frac{3}{4} \div 3 = \frac{7}{12}$

56. How many 3/4-cup servings can you get from 7 1/2 cups of coffee?

57. A rectangular room measures 12 1/2 feet by 15 1/3 feet. It is divided into three equal parts. Calculate the area of one of those parts.

58. The perimeter of a rectangular screen is 15 1/2 inches, and the ratio of its width to its height is 3:2. Find the width and height of the screen.

Integers

59. Write < or > between the numbers.

a. 0 ☐ −3 b. −2 ☐ −8

60. Write a comparison to match each situation (with < or >).

a. The temperature −7°C is warmer than −12°C.

b. Harry has $5. Emily owes $5.

61. Find the difference between the two temperatures.

a. −13°C and 10°C b. −9°C and −21°C

62. Write using mathematical symbols, and simplify (solve) if possible.

a. the opposite of 7 b. the absolute value of −6

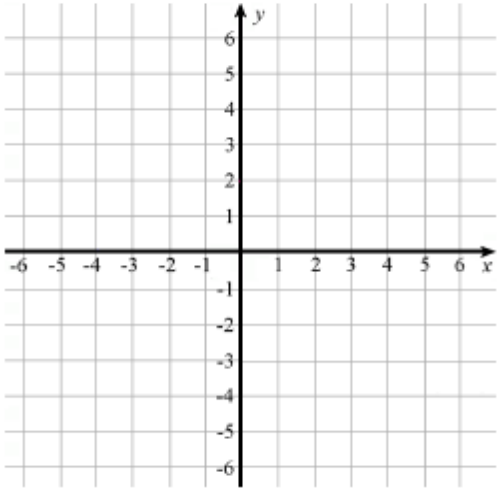
c. the absolute value of 5 d. the absolute value of the opposite of 6

63. a. Plot the point (−5, 3).

b. Reflect the point in the x-axis .

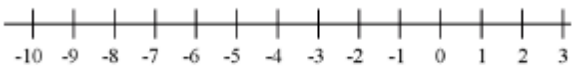
c. Now, reflect the point you got in (b) in the y-axis.

d. Join the three points with line segments.
What is the area of the resulting triangle?

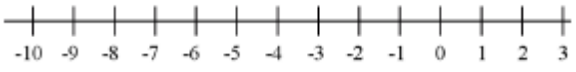


64. Draw a number line jump for each addition or subtraction sentence, and solve.

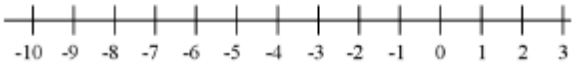
a. −2 + 5 = _____



b. −2 − 4 = _____



c. −1 − 5 = _____



65. Write an addition or subtraction in the box to match each situation, and fill in the blanks.

a. Elijah has saved \$10. He wants to buy shoes for \$14.
That would make his money situation to be _____.

_____

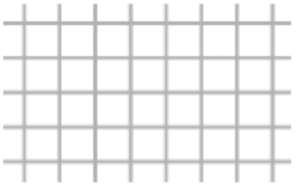
b. A fish was swimming at the depth of 2 m. Then it sank 1 m.
Now he is at the depth of _____ m.

_____

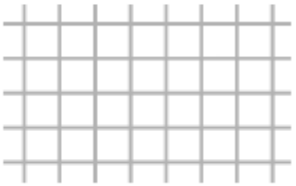
Geometry

66. Draw in the grid a right triangle with a base of 4 units and a height of 3 units.

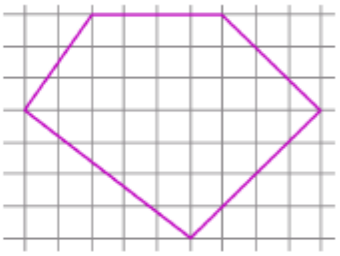
Calculate its area.



67. Draw in the grid a parallelogram with an area of 15 square units.



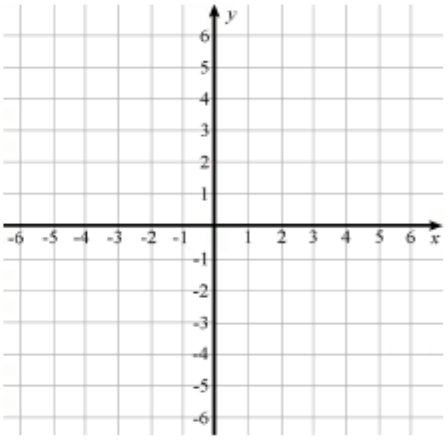
68. Find the area of this polygon, in square units.



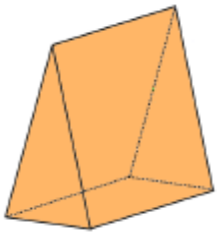
69. Draw a quadrilateral in the grid with vertices
(−5, 5), (−5, −3), (2, −1), and (2, 4).

What is the quadrilateral called?

Find its area.

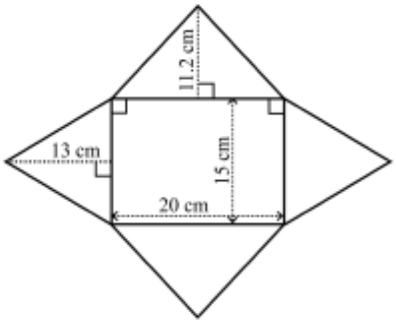


70. Name this solid. Draw a sketch of its net.

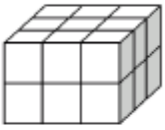
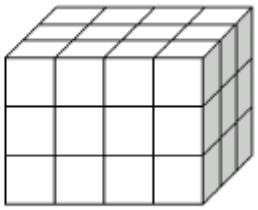


71. **a.** Name the solid that can be built from this net.

b. Calculate its surface area.



72. The edges of each little cube measure **1/2 cm**. What is the total volume of these figures, in cubic units?

 **a.**	 **b.**

73. A box containing a construction toy measures 1 3/4 in. by 8 1/2 in. by 6 inches.

a. Calculate its volume.

b. How many of these boxes fit into a crate with the inside measurements of 1 ft by 1 ft by 1 ft?

Statistics

74. **a.** Make a stem-and-leaf plot of this data.

55 59 61 62 64 65 65 68 69 70 72 74 77 83 89 94

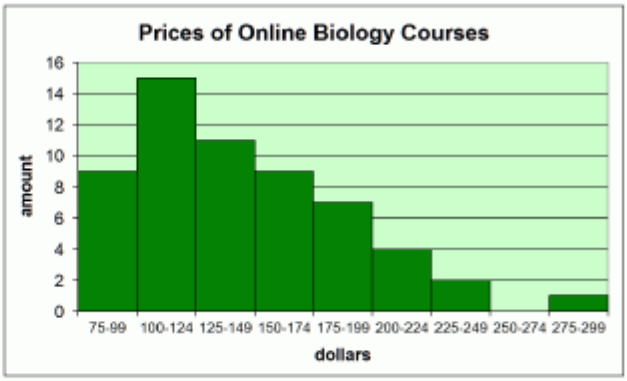
(The ages of people in a senior chess club)

Stem	Leaf

b. Find the median.

c. Find the interquartile range.

75. **a.** Describe the shape of this distribution.



b. Which measure of center would be best to describe this distribution?

76. **a.** Create a dot plot from this data.

9 10 5 6 4 8 7 3 8 1 7 7 5 7 8 9 5 6 6 7

(points on a math quiz of a group of students)

b. Describe the shape of the distribution.

c. Describe the spread of the data.

d. Choose a measure of center to describe the data, and determine its value.