

Things You Need to Know...

• Formulas for Area, Circumference and Volume

- Circle : $A = \pi \cdot r^2$, $C = \pi \cdot d$ or $2 \cdot \pi \cdot r$, For π use 3.14
- Rectangle : $A = l \cdot w$ or $b \cdot h$, $P = 2 \cdot l + 2 \cdot w$ or $2(l+w)$
- Triangle : $A = \frac{1}{2} b \cdot h$, $P =$ sum of all sides
- Trapezoid : $A = \frac{a+b}{2} \cdot h$, $P =$ sum of all sides
- Parallelogram : $A = l \cdot w$ or $b \cdot h$, $P = 2 \cdot l + 2 \cdot w$ or $2(l+w)$
- Cone : $V = \frac{1}{3} \pi \cdot r^2 \cdot h$
- Sphere : $V = \frac{4}{3} \pi \cdot r^3$
- Cylinder : $V = \pi \cdot r^2 \cdot h$
- Rectangular Prism : $V = l \cdot w \cdot h$

• Order of Operations

- First – Parenthesis
 - Solve anything inside grouping symbols (parentheses or brackets) first.
- Second – Exponents
 - Simplify any exponents
- Third – Multiply OR Divide
 - Multiply or divide from left to right, whichever comes *first*. Multiplication should not come before division unless it comes first in the expression / equation.
- Fourth – Add OR Subtract
 - Add or subtract from left to right, whichever comes *first*. Addition should not come before subtraction unless it comes first in the expression / equation

Things You Need to Know...

• Fraction Operations

- Adding & Subtracting
 1. Find a common denominator.
 2. Re-write each fraction with the common denominator.
 3. Add or subtract fractions and then whole numbers.
 4. Simplify your answer.

- Multiplying
 1. Cross reduce if possible.
 2. Multiply straight across.
 3. Simplify if possible.

- Dividing
 1. Write the second fraction as it's inverse.
 2. Follow steps for multiplication.

• Solving Equations

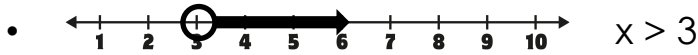
- One Step Equations
 1. Identify the operation being performed between the variable and the coefficient or constant.
 2. Perform the inverse of that operation with the constant or coefficient on both sides of the equation to eliminate it from the same side of the equation as the variable.

- Two Step Equations
 1. Identify the operation being performed with the constant (usually addition or subtraction).
 2. Perform the inverse of that operation with the constant on both sides to eliminate it from the side of the equation with the variable.
 3. Identify the operation being performed with the coefficient (usually multiplication or division).
 4. Perform the inverse of that operation with the coefficient on both sides to eliminate it from the side of the equation with the variable.

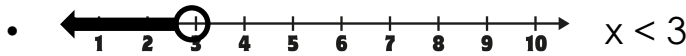
Things You Need to Know...

• Inequalities

- Greater than ($>$)



- Less than ($<$)



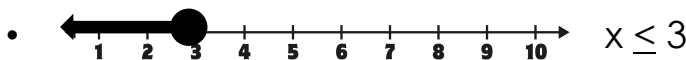
- Greater than or equal to (\geq)

- Also referred to as “at least” or “no less than”.



- Less than or equal to (\leq)

- Also referred to as “at most” or “no more than”.



- To solve an inequality, follow the same steps as solving equations.
 - If you are multiplying or dividing by a negative coefficient, you will need to reverse the direction of the inequality symbol in your answer.

✓ Example: $-4x < 20 = x > -5$

• Measures of Central Tendency

- Mean
 - The average. Take the sum of all numbers and divide by the total numbers in the data set.
- Median
 - The middle. Order the numbers from least to greatest and find the number in the middle. If there are two numbers in the middle, find the average of the two.
- Mode
 - The number that occurs the most in a set of data.
- Range
 - The difference between the smallest and largest numbers in a set of data.

Simplifying Expressions

Simplify each expression.

$ -15 - 4 \cdot 2$	$ -5 + 2 - 3$	$ -42 - 8 $	$ 3 \cdot -2 + 6 - 9$
$\frac{1}{5} - \frac{2}{3} + \frac{4}{5}$	$\frac{2}{5} \cdot \frac{1}{4} + \frac{1}{2}$	$5\frac{1}{2} \div \frac{1}{4} - \frac{7}{8}$	$-\frac{5}{6} + 4\frac{1}{3} - \frac{1}{4}$
$3 - 4(8 - 6)$	$\frac{1}{2}(8 - 10) + 6$	$8 - 5 + 2 \cdot 6 \div 3$	$-3(5 \cdot 4) + 12 \div 6$
$5(x + 2y) - 2(x - 3y)$	$-4(x - 7) + x$	$\frac{1}{2}(x - 7) + 4x - 10$	$8(x + 4y) + 3(-4x + y)$
$\frac{1}{5}(x + 10) + 5x$	$-4.8(2 - 8.2x) + 6x - 3$	$\frac{1}{2}(8y + 2x) - \frac{3}{4}x$	$-18x(3 - 4.6) - 10x$

Evaluating Expressions

Evaluate each expression.

$3x - 10 + 4$ if $x = 3$	$\frac{x}{2} + 6x$ if $x = -12$	$8(x - y)$ if $x = 2, y = 6$	$x + xy$ if $x = 3, y = -2.5$
$(2x)^2 + 6$ if $x = -2$	$3x + 4y - 3x$ if $x = 2, y = 4$	$-10x + \frac{4}{x}$ if $x = -2$	$3(8x - 10) + 5x$ if $x = \frac{1}{2}$
$x + 8y - (x)^2$ if $x = -5, y = \frac{1}{4}$	$(8x)^2 + 6x + 2$ if $x = -3$	$2x^2 + 4y^2 + xy$ if $x = \frac{1}{2}, y = 2$	$8x + 2y$ if $x = 1.5, y = -2.2$
$\frac{5}{2}(x - 6) + 4$ if $x = 8$	$3x - 8x^2 + 7$ if $x = 4.5$	$-2x^2 + 8y$ if $x = 3, y = -9$	$(-5x)^2 - 3x + x$ if $x = -3.5$

Calculating Percents

Percent of a number, percent change, percent increase/decrease.

1) What is 40% of 82?	2) What is 110% of 95?	3) What is 15.5% of 20?	4) What is 75% of 150?
5) Write two expressions that could be used to find 80% of x .		6) Write two expressions that could be used to find 105% of x .	
7) A price increases from \$82 to \$89.38. What is the percent change?	8) A price decreases from \$254 to \$213.36. What is the percent change?	9) The number of students increases from 640 to 768. What is the percent change?	10) A population decreases from 14,500 to 12,035. What is the percent change?
11) A dinner bill is \$45 and an 18% tip is left. How much is the tip?	12) A dinner bill is \$82 and a 15% tip is left. How much is the total cost?	13) There is a 7% sales tax on a \$425 television. How much is the tax?	14) There is a 22% room tax on a \$199 hotel rate. What is the total cost of a room for one night?
15) Ken makes \$400 a week before a 5% raise, and then another 6% raise. What is his weekly pay now?		16) Amy bought a \$750 couch. She used a 15% off coupon. There is 6% tax on the discounted price. How much does she pay?	

Using Formulas

Solve using the given formulas. Round to the nearest hundredth.

Use the formula $d = rt$ for questions 1-4.

1) Alex travels 46 miles per hour for 3.2 hours. How far has he gone?

2) Ben just drove 426 miles in 6.4 hours. What was his average rate of speed?

3) Mia is driving at a constant speed of 55 mph and drives 236.5 miles. How long was she driving?

4) Eric drives 62 mph for $5\frac{1}{4}$ hours. How far does he drive?

Use the formulas $\frac{5}{9}(F-32)=C$ and $\frac{9}{5}C+32=F$ for questions 5-8.

5) Convert 80°F to Celsius.

6) Convert 42.5°F to Celsius.

7) Convert 12°C to Fahrenheit.

8) Convert 27.75°C to Fahrenheit.

Use the formula $I = Prt$ for questions 9-12.

9) You put \$5,000 in the bank for 4 years with a 1.2% interest rate. How much interest is earned?

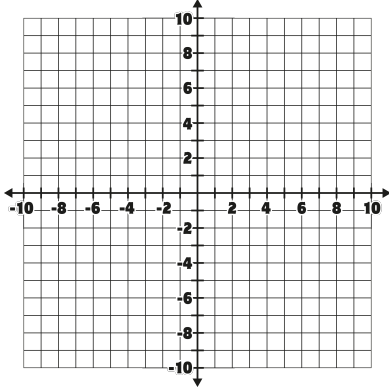
10) James earned \$3,000 interest on an investment that he put in the bank for 6 years with a 5% interest rate. How much was his initial deposit?

11) Kyle puts \$740 in the bank for 5.5 years with a $2\frac{1}{2}\%$ interest rate. How much money does he have in the bank all together after 5.5 years?

Graphing on a Coordinate Plane

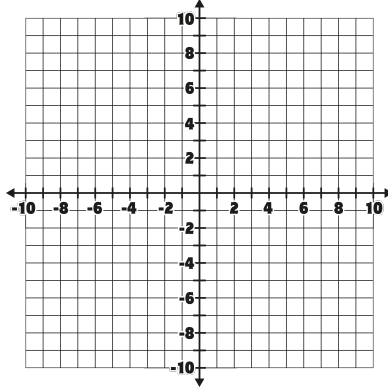
1) Graph the equation:

$$y = \frac{1}{2}x + 4$$



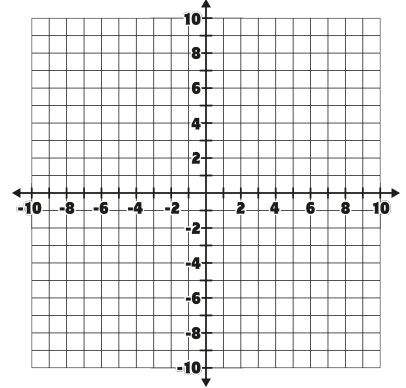
2) Graph the equation:

$$y = -4$$



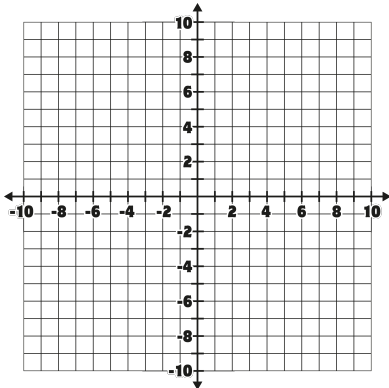
3) Graph the equation:

$$y = -\frac{2}{3}x$$



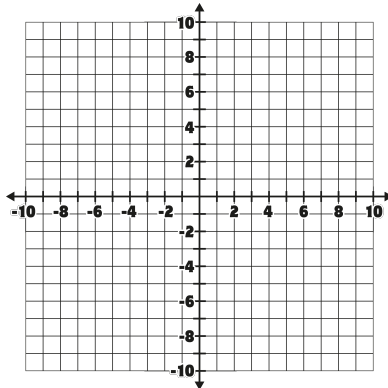
4) Graph the equation:

$$y = -\frac{5}{4}x + 5$$



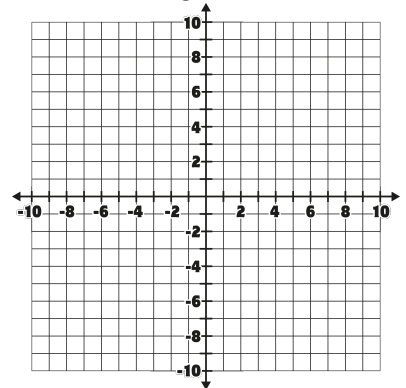
5) Graph the equation:

$$x = 6$$



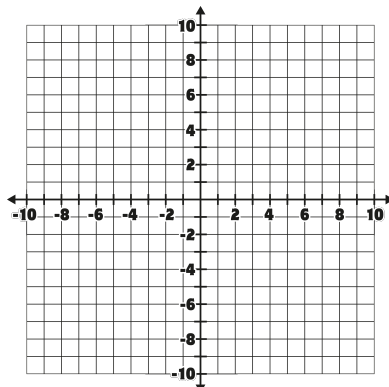
6) Graph the equation:

$$y = \frac{1}{3}x - 3$$



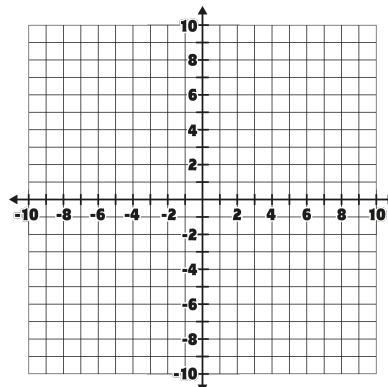
7) Graph the equation:

$$y = 6x - 5$$



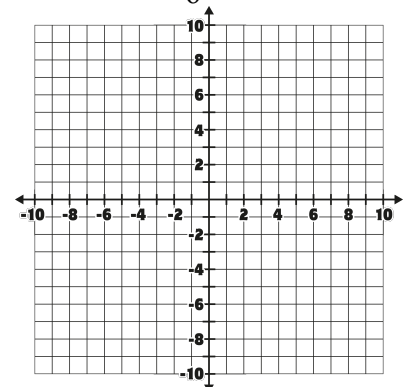
8) Graph the equation:

$$y = -4x - 4$$



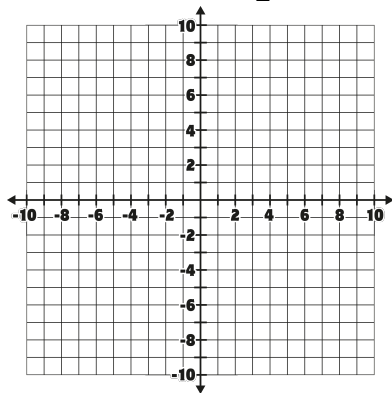
9) Graph the equation:

$$y = \frac{5}{6}x - 6$$

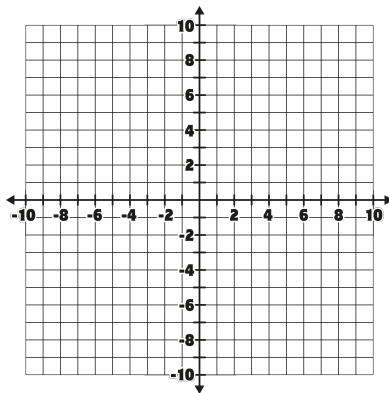


Graphing Inequalities on a Coordinate Plane

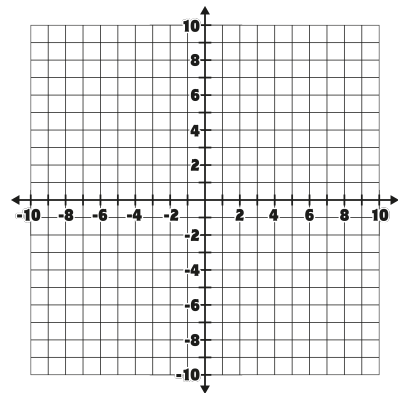
1) Graph the solution to the inequality:
 $y < \frac{1}{2}x - 2$



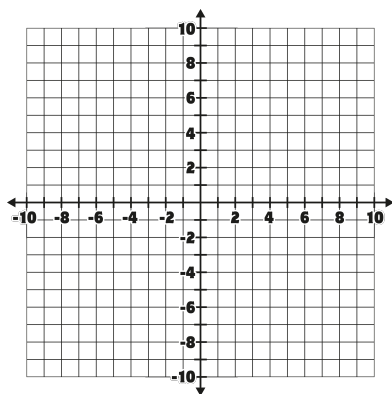
2) Graph the solution to the inequality:
 $y \geq 3$



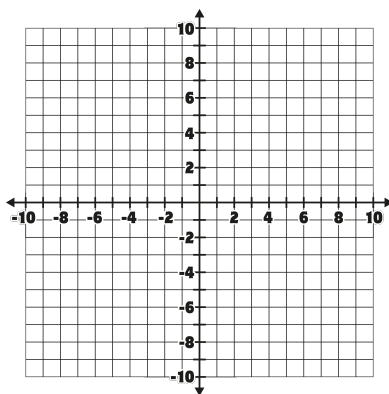
3) Graph the solution to the inequality:
 $y \leq -\frac{4}{3}x + 2$



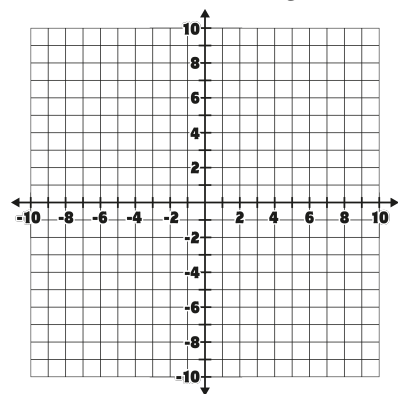
4) Graph the solution to the inequality:
 $y > \frac{1}{4}x + 2$



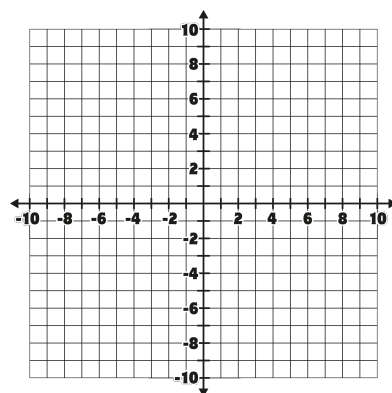
5) Graph the solution to the inequality:
 $x > 1$



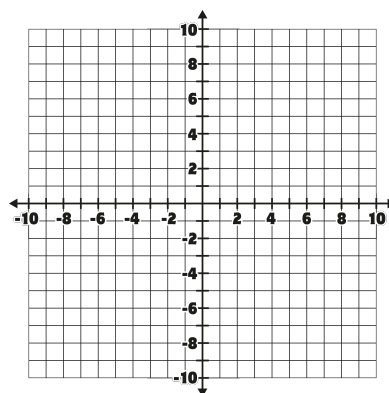
6) Graph the solution to the inequality:
 $y \geq -\frac{1}{3}x + 4$



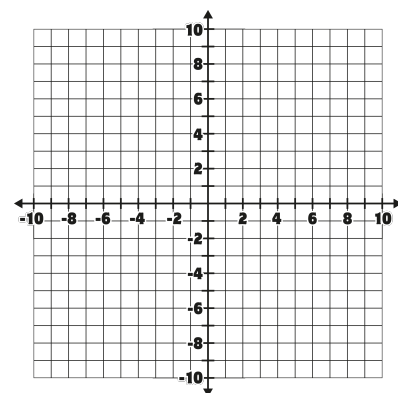
7) Graph the solution to the inequality:
 $y \geq -2x + 6$



8) Graph the solution to the inequality:
 $y \leq 4x - 2$



9) Graph the solution to the inequality:
 $y < \frac{3}{4}x + 2$



Scale and Proportions

Round to the nearest tenth.

1) Find the missing value.

$$\frac{3}{5} = \frac{15}{x}$$

2) Find the missing value.

$$\frac{x}{6} = \frac{15}{20}$$

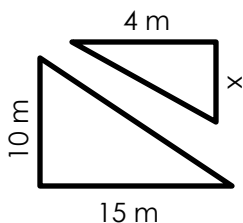
3) Find the missing value.

$$\frac{2}{8} = \frac{x}{7}$$

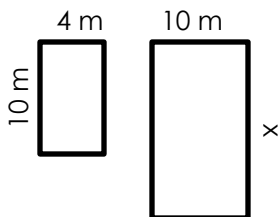
4) Find the missing value.

$$\frac{12}{x} = \frac{5}{1}$$

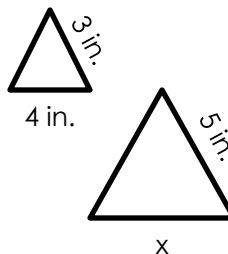
5) Determine the missing side length.



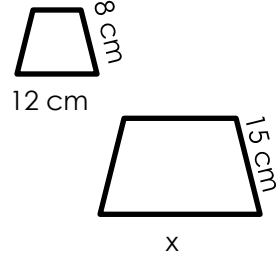
6) Determine the missing side length.



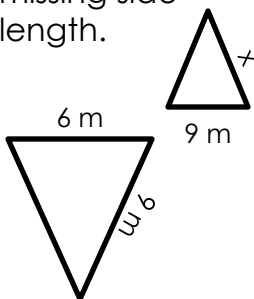
7) Determine the missing side length.



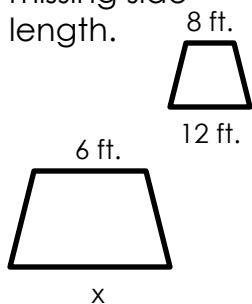
8) Determine the missing side length.



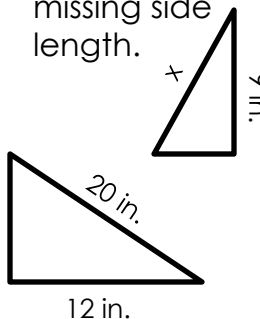
9) Determine the missing side length.



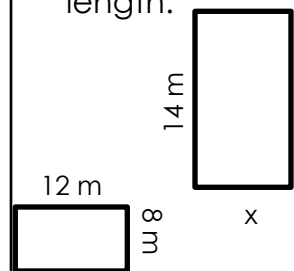
10) Determine the missing side length.



11) Determine the missing side length.



12) Determine the missing side length.



13) Find the missing value.

$$\frac{3.5}{6} = \frac{10}{x}$$

14) Find the missing value.

$$\frac{x}{2} = \frac{13}{15}$$

15) Find the missing value.

$$\frac{1}{6} = \frac{x}{15}$$

16) Find the missing value.

$$\frac{5}{x} = \frac{2}{1}$$

Solving Equations

Solve each equation. Round to the nearest tenth.

$3x + 6 = 20$	$-\frac{3}{4}x + 6 = 5\frac{5}{16}$	$7x + 5 = 68$	$-\frac{7}{8} + 5x = 44\frac{1}{8}$
$-2x - 5 = -23$	$7x + 6 + x = 62$	$6 + 3x - 6x = -18$	$-6.5x + 1 = -29$
$3x - 4(8x - 6) = 20$	$6x + 7 = -47$	$-6 - 5x = -41$	$4x - 9 - 7x = -12$
$3x - 2 - 7x = -22$	$-54 = 2x + 7x + 9$	$\frac{1}{2}(x - 8) + 4x = 10$	$8(x + 4) + 3(-4x) = 32$
$\frac{1}{5}(x + 10) + 5x = 25$	$-4(2 - 8.2x) = 30$	$5 + 3x - x = 25$	$6x + 4 - 7x = 88$

Measures of Center

Find each measure of center. Round to the nearest tenth.

Use the test scores to answer questions 1 – 4.

62 80 65 75 99 80 100 98 65 57
46 87 80 90 72 98 82 65 66 84

1) What is the average test score?

2) What is the mode of the test scores?

3) What is the range of the test scores?

4) What is the median test score?

Use the newborn weights (in pounds) to answer questions 5 – 8.

4.2 6.8 10.2 9.8 9.3 8.6 7.4 5 6.2 8.7 9.2
9 7.3 5.2 6 6.8 8.4 7 7.5 8 8.3 11

5) What is the average newborn weight?

6) What is the mode of the newborn weights?

7) What is the range of the newborn weights?

8) What is the median newborn weight?

Use the salaries (in dollars) to answer questions 9 – 12.

30,450 60,300 112,080 80,500 72,600 42,000
54,000 67,500 23,750 52,000 64,800 70,700

9) What is the average salary?

10) What is the mode of the salaries?

11) What is the range of the salaries?

12) What is the median salary?

Area, Circumference & Perimeter

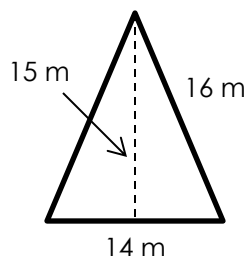
Round to the nearest hundredth. Use 3.14 for π .

1) Farmer Johnson is fencing in an area for his horses. The field measures 150 feet by 165.5 feet. How much fencing will he need?

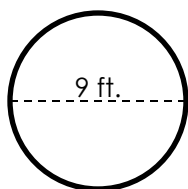
If fencing costs \$1.50 per foot. How much will he spend on fencing?

2) A circular pool needs a cover. If the pool has a radius of 6.75 feet, what will the area of pool cover be?

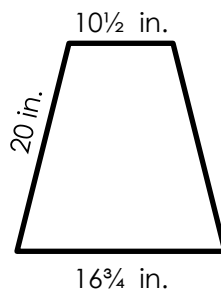
3) Determine the area.



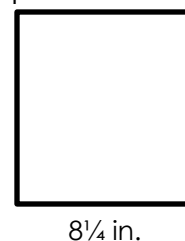
4) Determine the area.



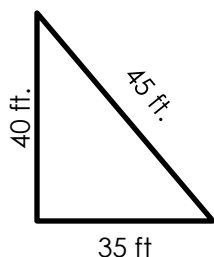
5) Determine the perimeter.



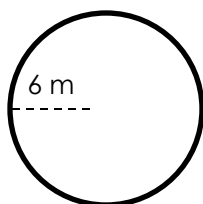
6) Determine the perimeter of the square.



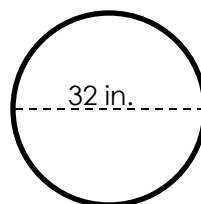
7) Determine the area.



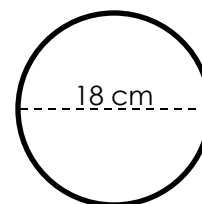
8) Determine the circumference.



9) Determine the area.



10) Determine the circumference.



11) A square park needs grass. Sod is sold by the square foot. If the park has a side length of 32.5 feet, how much sod is needed?

12) Anna is putting a ribbon around a circular picture frame. The frame has a diameter of 12.7 inches. How long does the ribbon need to be?

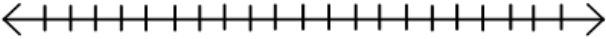
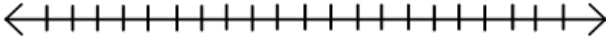
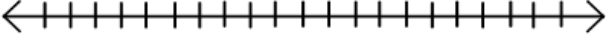
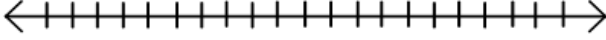
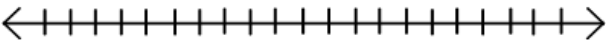
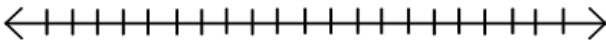
Writing Equations for Lines

Write the equation represented by each situation.

1) Carl makes \$10.25 per hour, h , plus a daily bonus of \$25. Write an equation that represents his total earnings, t , each day.	2) It costs \$10 to enter a theme park and \$2 for each ticket, t . Write an equation that represents the total cost, c , of going to the theme park.	3) James has \$150 in savings and earns an additional \$50 per week, w , cutting grass. Write an equation that represents the total, t , in his account.
4) A shipping company charges a \$5.50 flat rate, plus \$0.20 per pound, p . Write an equation that represents the total cost, c , of shipping.	5) Adam has \$60 on a gift card. He buys h hats for \$4.00 each. Write an equation that represents the amount left, a , on his gift card.	6) A car rental company charges \$120 plus \$0.37 per mile, m . Write an equation that represents the total cost, c , of renting a car.
7) Cora bought g bags of candy for \$1.45 each and a gallon of milk for \$3.49. Write an equation to represent the total amount, a , spent at the store.	8) Mya bought x shirts for \$14.50 each and used a \$20 coupon. Write an equation that represents the total amount, a , she spent.	9) Ken can run m miles at a pace of 6.30 minutes per mile. He ran slower for 10 minutes to warm up. Write an equation that represents the total time, t , Ken spent running.
10) Henry raised \$ X for the fundraiser. Darla raised \$5 less than twice as much as Henry. Write an equation that represents the total, t , amount raised by both Henry and Darla.	11) A scuba company charges \$20 for equipment rental plus \$5 per hour, h , for use. Write an equation that represents the total cost, c , of renting scuba equipment.	12) Melissa earned \$1,200 last week. She is donating an equal amount, a , to three different charities. Write an equation that represents how much money Melissa has left, m .

Solving Inequalities

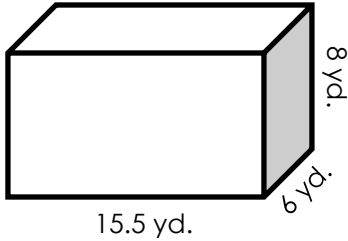
Solve each inequality. Round to the nearest tenth. Graph #1 – 6 on the number line.

$-7x + 6 \leq 20$ 		$-3x + 6 > 5$ 	
$2x - 7 > -21$ 		$3 + 3x - 6x \leq -12$ 	
$3x - \frac{1}{2}(8x - 6) < 10$ 		$-5 - 2x \geq -21$ 	
$12x - 2 - 7x > -22$	$-20 - 2x > 5x - 8$	$\frac{1}{2}(-6x + 2) + 4x \geq 10$	$2(2x - 4) - 5(-4x) \leq -20$
$2(x + 1) + 5x \geq -19$	$4(2 - 1x) < 30$	$5 + 3x \leq 15 + x$	$6x + 4 < 30$

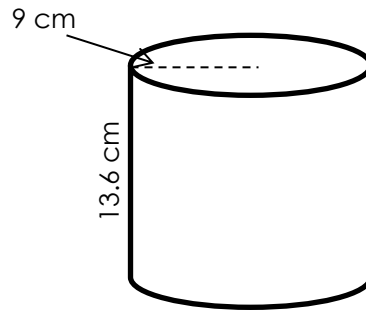
Surface Area & Volume

Round to the nearest hundredth. Use 3.14 for π .

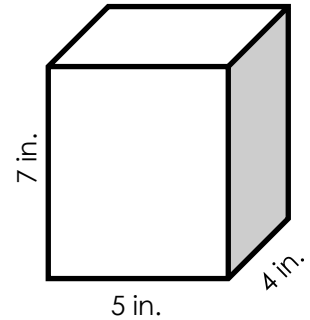
1) Find the surface area.



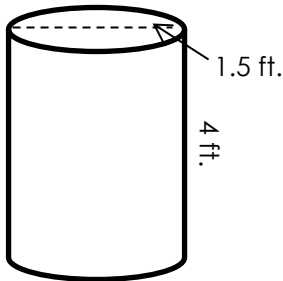
2) Find the volume.



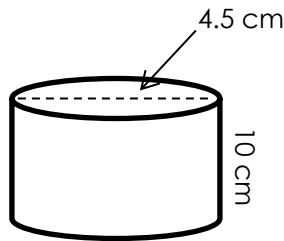
3) Find the volume.



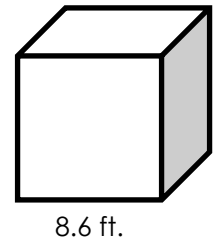
4) Find the surface area.



5) Find the volume when filled halfway.



6) Find the volume of the cube when filled 75%.



7) Nina is painting a bird house. The bird house is in the shape of a cube and has an edge length of 6.5 inches. How much paint will Nina need?

8) Ryan has a pool in his backyard. The pool measures 52 feet long, 25 feet wide, and 8.5 feet deep. How much water will fit in the pool?

9) How much gift wrap is needed to cover a box measuring 18 inches by 12 inches by 4 inches?

10) A cylindrical lava lamp is 18 inches tall. The radius of the lamp is 5.25 inches. How much liquid is in the lamp?

11) What is the surface area of a box in the shape of a rectangular prism with a length of 8 inches, width of 9 inches, and height of 4 inches?

12) A soda can has a diameter of 2.3 inches and a height of 9.5 inches. What is the volume?

Pythagorean Theorem

Round to the nearest hundredth.

1) In a right triangle, find the measure of b if $a = 12$ inches and $c = 16$ inches.

2) In a right triangle, find the measure of a if $b = 14$ centimeters and $c = 20$ centimeters.

3) In a right triangle, find the measure of c if $a = 6.5$ meters and $b = 8$ meters.

4) In a right triangle, find the measure of c if $a = 5$ inches and $b = 6$ inches.

5) In a right triangle, find the measure of a if $b = 19$ feet and $c = 26$ feet.

6) In a right triangle, find the measure of b if $a = 19$ inches and $c = 22$ inches.

7) A park is 6 miles north of the beach. The beach is 4.6 miles west of the school. What is the distance of the straight line between the school and the park?

8) In a right triangle, find the measure of c if $a = 15.5$ centimeters and $b = 16.5$ centimeters.

9) A 15 foot tall tree casts a shadow. The distance between the top of the tree and the end of the shadow is 22 feet. How long is the shadow?

10) In a right triangle, find the measure of a if $b = 35$ meters and $c = 40$ meters.

11) In a right triangle, find the measure of b if $a = 15$ inches and $c = 20$ inches.

12) A television is 30 inches tall and 42 inches long. What is the length of the straight line from the top right corner of the TV to the bottom left corner?

Order of Operations

Simplify each expression. Round to the nearest hundredth.

1) $4^2 + 2(6) - 8$

2) $9 \div 3 + 6 \cdot 2 \div 2^2$

3) $20 - 4(4) - 2 + 6$

4) $9 - 6 + 2(3^2 + 4)$

5) $-10 + 4(3 - 8) + 2^2$

6) $5^2 + 6(2 \cdot 6 \div 3) - 4^2$

7) $12 - 3^2(8 - 4 \cdot 5)$

8) $-10 + 3(12 \div 6 \cdot -2)^2$

9) $2.2 \cdot 9 + 8 \div 0.4 - 6$

10) $1.5 + 2.3 - 0.75(4 \cdot 2.6)$

11) $5 - \frac{1}{2} (6 \frac{1}{2} + 14 - 12 \frac{2}{3})$

12) $10 \frac{3}{4} + 2 \frac{1}{5} \cdot 6 \frac{1}{8} - 3 \frac{4}{5}$

13) $5^2 - 12(3 \frac{1}{2} \cdot 3.4 - 8)$

14) $-5 \frac{1}{2} + \frac{1}{4} ((-4)^2 + 8)$

15) $6(3.5 \cdot 2)^2 - 18 \div 2 \frac{1}{2}$

Mixed Review

Round to the nearest hundredth.

1) Simplify.

$$-2(5x + 3y) - 2(3x - y)$$

2) Solve.

$$-8 + 3x - 6 = -2$$

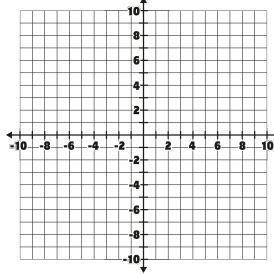
3) Solve $x + xy$

$$\text{if } x = \frac{1}{2}, y = 2.5$$

4) Ben drove 584 miles in 8.2 hours. What was his average rate of speed?

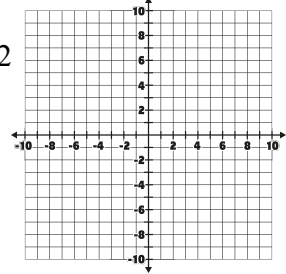
5) Graph the equation

$$y = \frac{3}{5}x - 4$$



6) Graph the equation

$$y = -4x + 2$$

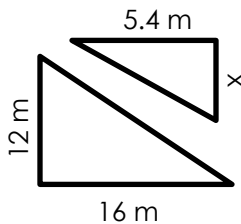


7) How do you find the mean of a set of data?

8) A price decreases from \$986 to \$828.24. What is the percent change?

9) A square flower bed needs mulch, which is sold by the square foot. If the flower bed has a side length of 2.5 feet, how much mulch is needed?

10) Determine the missing side length.



11) A dinner bill is \$102 and an 18% tip is left. What is the total spent on dinner?

12) A car rental company charges \$85 plus \$0.22 per mile, m . Write an equation that represents the total cost, c , of renting a car.

13) Write an equation in slope intercept form for the line represented by the points in the table.

x	y
0	6
2	5
4	4

14) Solve.

$$-2 + 4x > 5x - 6$$

15) A house is 32 feet tall. It casts a shadow that is 45 feet long. What is the distance from the top of the house to the end of the shadow?

Mixed Review

Round to the nearest hundredth.

1) Simplify.

$$\frac{1}{5}(5x + 2y) - \frac{1}{2}(6x - 2y)$$

2) Solve.

$$-14x + 2 + 6x = -2$$

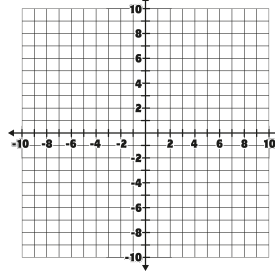
3) Solve $|x + xy|$

if $x = -4, y = 0.5$

4) After driving for 3.75 hours at an average speed of 62mph, how far have you traveled?

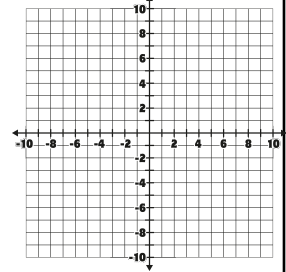
5) Graph the equation,

$$y = -x + 3$$



6) Graph the equation,

$$y = -\frac{2}{5}x$$



7) How do you find the median of a set of data?

8) Kim's weekly pay increases from \$584.60 to \$701.52. What is the percent change?

9) Joy is putting new carpet in her office. The room is 8.5feet by 11.7feet. How much carpet will be needed?

10) A scale on a map is 1 inch : 45 miles. If you travel 150 miles, what is the distance on the map?

11) A \$450 television is discounted 15%. 6% sales tax is added onto the new price. How much is the television after tax?

If carpet is \$1.67 per square foot. What will be the cost of the carpet?

12) Write an equation in slope intercept form for the line represented by the points in the table.

x	y
0	-5
3	-6
9	-8

13) Solve.

$$-2 + \frac{1}{2}x > 5x - 14$$

14) A cabin is 13.5 feet tall. It casts a shadow that is 5 feet long. What is the distance from the top of the cabin to the end of the shadow?