

Name: \_\_\_\_\_

## **SUMMER WORK**

### **Skills Review for Students Entering “Geometry” or “Geometry with Trig”**

The following is a review of math skills that you will be expected to apply in your Geometry course next year. Complete this review over the summer. It is due on the first day of class and will be worth three homework credits.

The purpose of the packet is to provide an opportunity for you to refresh yourself on some math skills that you will be using throughout the Geometry course. Solutions to the problems are attached and students are expected to check their answers. If you have difficulty with any topic, it is recommended that you invest some time over the summer reviewing those particular skills, so that you will come to Geometry prepared for success. One way to review would be look on-line for tutorials or instructional videos.

You will need a protractor to complete this review.

Calculators should not be used except on problems marked by a double asterisk (\*\*).

Show all work where calculations are necessary.

1. a) Examine a protractor. Sketch a drawing of the protractor, labeling the markings at 10 degree increments.

b) Explain why a protractor has two sets of degree markings from  $0^\circ$  to  $180^\circ$ , going in opposite directions.

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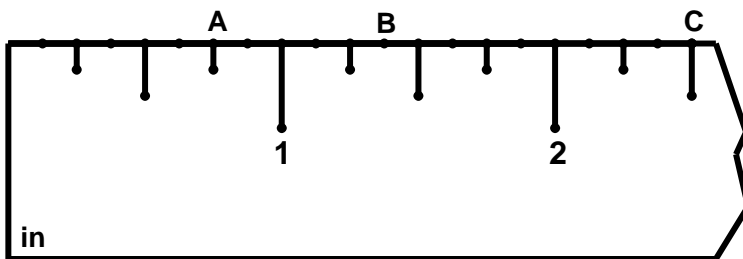
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2. Using the image of the inch ruler below, read the lengths to points A, B and C. Use fractions.

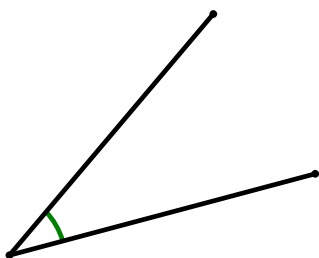


A= \_\_\_\_\_

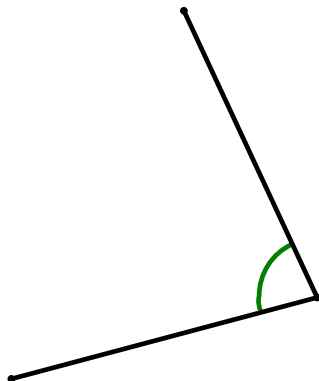
B= \_\_\_\_\_

C= \_\_\_\_\_

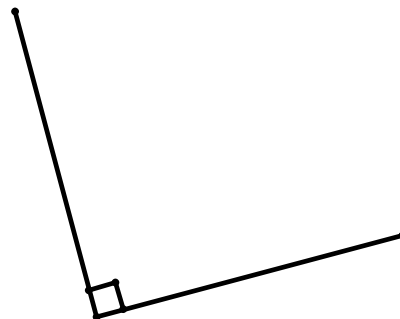
3. a) Without measuring, estimate the measure of the angles below.



estimate: \_\_\_\_\_



estimate: \_\_\_\_\_



estimate: \_\_\_\_\_

b) After estimating, use a protractor to determine the measure of the angle.

actual: \_\_\_\_\_

actual: \_\_\_\_\_

actual: \_\_\_\_\_

4. Using a protractor, accurately draw angles of the following measures:

a)  $30^\circ$

b)  $125^\circ$

c)  $68^\circ$

d)  $90^\circ$

5. Using a ruler, draw line segments of the following lengths.

a)  $2\frac{1}{4}$  inches

b) 6.5 cm

c) 45 mm

6. a) Round 534.785 to the nearest hundredth. \_\_\_\_\_
- b) Round  $\frac{2}{3}$  to the nearest thousandth. \_\_\_\_\_
- c) \*\* Approximate  $\sqrt{75}$  to the nearest tenth. \_\_\_\_\_
7. a) Which is longer, a meter or a yard? \_\_\_\_\_
- b) How many inches are in a yard? \_\_\_\_\_
- c) How many centimeters are in a meter? \_\_\_\_\_
- d) Convert 45 inches to feet. \_\_\_\_\_
- e) Convert 115 cm to meters. \_\_\_\_\_
- f) \*\* Given that **5280 ft = 1 mile**:
- i) How many miles are there in 760 ft?
- ii) How many inches are there in one mile?
- g) How many cm are there in 1 kilometer?
- h) \*\* Given that **128 oz = 1 gal**, how many 8 oz glasses can be filled from a 3 gallon pitcher?
8. A room is 8 x 12 feet. How many 6 inch tiles will it take to tile the room?
9. \*\* Peter scored 92, 83, and 95 on his three tests. What is his average, or mean, score?
10. How many degrees are there in a circle? \_\_\_\_\_; in a quarter circle? \_\_\_\_\_.

11. A rectangle measures 12 feet in length and 18 feet in width. *(Include units)*

a) Find its area. \_\_\_\_\_      b) Find its perimeter. \_\_\_\_\_

12. A triangle has a base of 6 m and a height of 4 m. Find its area. \_\_\_\_\_ . *(Include units)*

13. \*\* A circle has a radius of 15 cm. *(Include units)*

a) Find its area. \_\_\_\_\_      b) Find its perimeter. \_\_\_\_\_

14. Given  $4x - 3y = 12$ , if  $y = 6$ , find  $x$ . \_\_\_\_\_

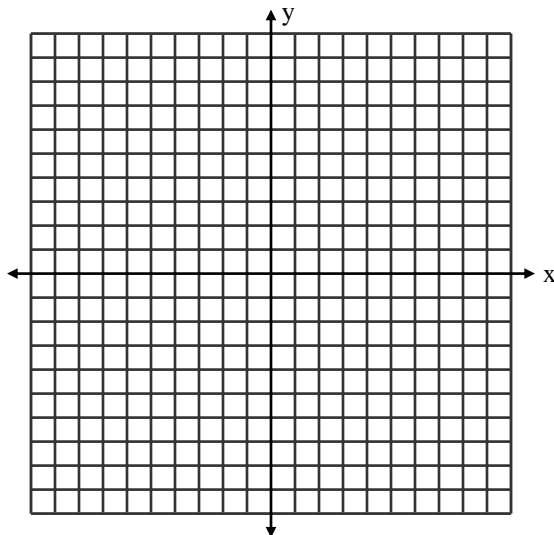
15. Graph and label the following points on the coordinate plane.

A: ( 5, 6)

B: (7, -4)

C: (3.5, 0.5)

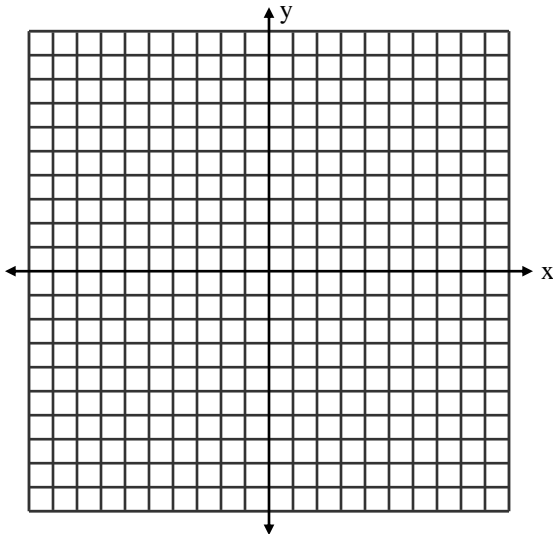
D: (-1/2, -3 1/2)



16. On the coordinate plane above, draw a solid, horizontal line and a dotted vertical line. Label their point of intersection with the coordinates of the point.

**17. An oblique line is neither horizontal nor vertical.**

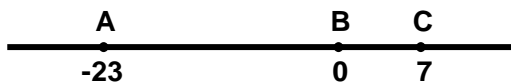
- a) On the coordinate plane below, draw an oblique line passing through the point (0,-2). Label the line as “oblique”.
- b) Draw a line that is parallel to the line from Part (a) that passes through the point (0,-5).
- c) Draw a line that is perpendicular to the line in Part (a) that passes through the point (0, -2).



**18. Absolute Value- Evaluate the following expressions.**

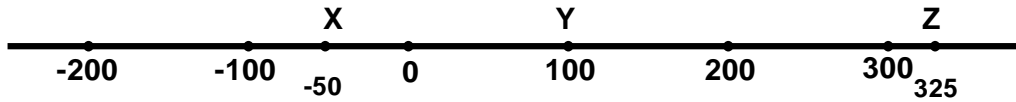
- a)  $|18|$       b)  $-|18|$       c)  $|-18|$       d)  $|4-19|$       e)  $|19.3-11|$
- f)  $|-19.3+11.5|$       g)  $|7-(-5)|$       h)  $|(-7)-(-5)|$       i)  $|-7+(-5)|$

**19. On the given number line, find the distance between point A and point C.**



- 20. On a number line, if the coordinate of point  $M$  is 53 and the coordinate of point  $N$  is 12, find the distance between the points.
- 21. A person stretches a tape measure over a table. At one edge of the table, the tape measure reads 4". At the other edge, the tape measure reads 45". How long is the table from edge to edge?
- 22. There are 27 marbles in a bag. If 12 are red and the rest are black, what is the ratio of red marbles to black marbles?
- 23. The temperature rises  $21^{\circ}\text{C}$  in 6 hours. What is the rate of the temperature rise?

24. Use the number line below.



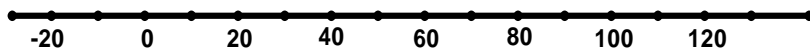
a) Find: i)  $XY$  \_\_\_\_\_ ii)  $YZ$  \_\_\_\_\_ iii)  $XZ$  \_\_\_\_\_

b)  $XY + YZ =$  \_\_\_\_\_

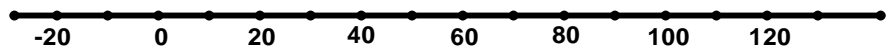
c) If  $ZW = 75$ , give two possible coordinates for  $W$ . \_\_\_\_\_, \_\_\_\_\_

25. Solve and graph solutions on the number lines below:

a)  $3m + 81 \leq 180$



b)  $0 \leq 83 - n < 90$

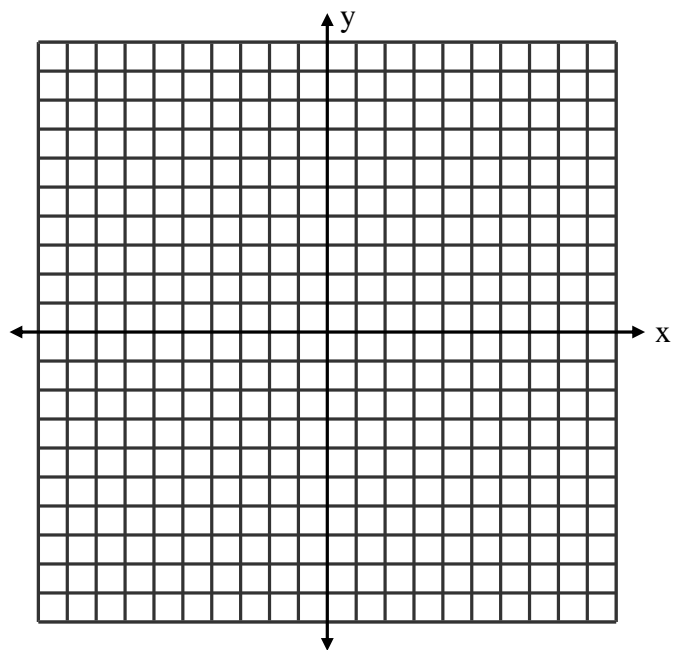


26. a) Find the equation of the line containing the points  $(-2, 1)$  and  $(5, -6)$ . \_\_\_\_\_

b) Graph the line.

c) Give the slope of the line. \_\_\_\_\_

d) Give the y-intercept. \_\_\_\_\_



27. Use the equation  $x - 3y = 7$  and complete the table by solving for the missing variable.

x	y
3	
	5 1/2
-2	
	-12

28. Match the equation of the line to the name of its form:

- a)  $y = -6x + 7$  \_\_\_\_\_ standard form  
 b)  $y - 2 = 3(x + 10)$  \_\_\_\_\_ slope-intercept form  
 c)  $2x - 5y = 11$  \_\_\_\_\_ point-slope form

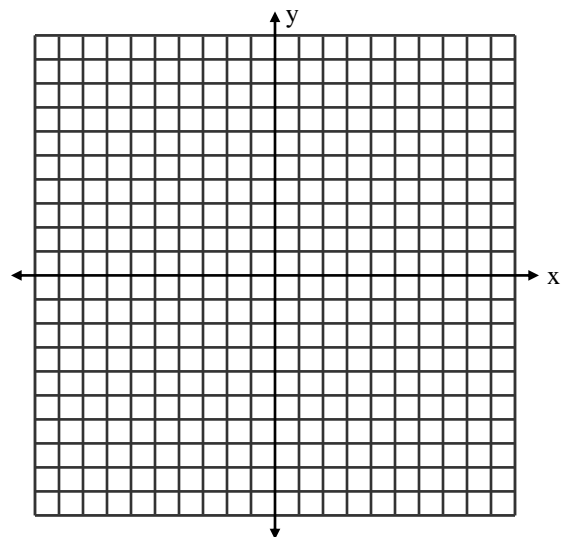
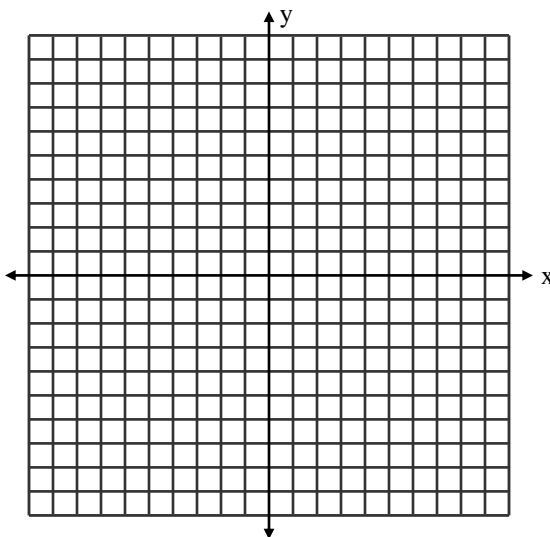
29. Classify the line and horizontal, vertical or oblique (i.e. neither horizontal or vertical):

- a)  $y = 6$  \_\_\_\_\_  
 b)  $y = x$  \_\_\_\_\_  
 c)  $x = -4.25$  \_\_\_\_\_  
 d)  $x + y = 9$  \_\_\_\_\_

30. Graph the set of ordered pairs satisfying each equation:

a)  $y = \frac{2}{3}x + 1$

b)  $x + 3y = 9$



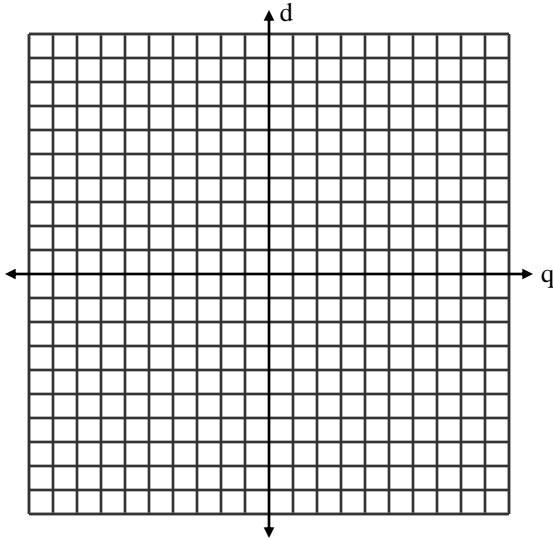


31. Max has \$6 in quarters,  $q$ , and dimes,  $d$ .

a) Name, as ordered pairs  $(q, d)$ , five combinations of coins he might have.

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b) Graph these points below.



c) Do these points lie on the same line? \_\_\_\_\_

32. Give the equation for the horizontal line that passes through  $(2, -5)$ . \_\_\_\_\_

33. Give the equation for the vertical line that passes through  $(h, k)$ . \_\_\_\_\_

34. A line has a slope of  $\frac{3}{4}$ . What is the slope of a line perpendicular to it? \_\_\_\_\_

35. What is the slope of the line parallel to the line  $x + 3y = 9$ ? \_\_\_\_\_

36. Solve the systems of equations.

a)  $y = 4x$   
 $y = x + 20$

b)  $2x - y = 14$   
 $x + y = 4$

**37. Sets- Given:** **Set A** is the set of even numbers between 0 and 16.  
**Set B** is the set of numbers divisible by 3 between 0 and 16.

a) List the **elements** of set A: \_\_\_\_\_

b) List the **elements** of set B: \_\_\_\_\_

c) List the elements of the **union** of set A and set B, (i.e.  $A \cup B$ ):

\_\_\_\_\_

d) List the elements of the **intersection** of set A and set B, (i.e.  $A \cap B$ ): \_\_\_\_\_

**38. Sets-** M is the set of all words that begin with the letter m, and T is the set of all words with two syllables. Name a word that is an **element** of  $M \cap T$ . \_\_\_\_\_

**39. Expand the following expressions.**

$$5(3 + x)$$

$$(s + r)t$$

$$(c - 2d)d$$

**40. Simplify the following expressions.** Express your answer using whole numbers, fractions or as radicals, as appropriate. Do not use decimals. Simplify all answers. Rationalize any denominators.

$$180 - (10x - 5) + 8$$

$$360 - 3(5 + 3x)$$

$$\frac{10x - 5}{15}$$

$$\frac{2}{5} \div \frac{3}{8}$$

$$\frac{2}{5} + \frac{3}{8}$$

$$\frac{2}{5} \cdot \frac{3}{8}$$

$$\frac{2x}{\left(\frac{1}{3}\right)}$$

$$\sqrt{81}$$

$$\sqrt{169}$$

**41. Simplify the following expressions if possible.** Express your answer using whole numbers, fractions or as radicals, as appropriate. Do not use decimals. Rationalize any denominators. If the expression cannot be simplified, write “*simplified.*”

$$\sqrt{\frac{4}{25}}$$

$$\sqrt{18}$$

$$\sqrt{\frac{1}{8}}$$

$$\frac{4}{r} \cdot \frac{1}{4} \cdot r \cdot x$$

$$\frac{3}{r} \cdot \frac{4}{3} \cdot \pi r^2$$

$$\sqrt{9+9}$$

$$\sqrt{5} + \sqrt{5}$$

$$\sqrt{5} \cdot \sqrt{5}$$

$$\sqrt{x} \cdot \sqrt{x}$$

$$3\sqrt{5} + 2\sqrt{5}$$

$$3\sqrt{5} \cdot 2\sqrt{5}$$

$$\sqrt{4a+4b}$$

$$\sqrt{a^2b^2}$$

$$\sqrt{a^2+b^2}$$

$$\sqrt{\frac{1}{9}a - \frac{1}{9}b}$$

$$\sqrt{9x^2}$$

$$x - \frac{x+y}{2}$$

$$\frac{6x+7}{3}$$

**42. Factor.**

$ax + 3x$

$6b - 30c$

$\frac{1}{2}xz + \frac{1}{2}yz$

**43. Multiply the binomials.**

$(x + 2)(x + 5)$

$(3a + 2)(3a - 2)$

$(m - n)^2$

**44. Solve for the given variable.** Express your answer as a whole number, a fraction or as a radical as appropriate. Do not use decimals. Simplify all answers. Rationalize any denominators.

$x - 23 = 180 - x$

$y = 6(90 - y)$

$\frac{1}{4}(a - 2) = 17 - a$

$15x - 22 + 17x + 10 = 180$

$50z + 3 = 67z + 1$

$90 > 32 + z > 0$

$180 > 19 - q > 90$

$x^2 = 49$

$x^2 - 10 = 2$

$3x^2 = 25$

$(w + 5)^2 = 289$

$\frac{x}{5} = \frac{11}{2}$

**45. Solve for the given variable.** Express your answer as a whole number, a fraction or as a radical as appropriate. Do not use decimals. Simplify all answers. Rationalize any denominators.

$$\frac{2}{m} = \frac{4}{7}$$

$$\frac{3}{5} = \frac{2d}{13}$$

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

$$\frac{2y-5}{5} = \frac{3y+14}{8}$$

$$w-9 = \frac{3}{4} \cdot w$$

$$2\pi r = 42$$

$$n^2 - 7n + 12 = 0$$

$$x^2 + 8x + 16 = 0$$

$$b^2 - 25 = 0$$

**46. Solve for the given variable.**

**Solve for  $m$ :**  $225p = 15m$

**Solve for  $x$ :**  $50n - 100 + x = 50n$

**Solve for  $w$ :**  $A = lw$

**Solve for  $l$ :**  $p = 2l + 2w$

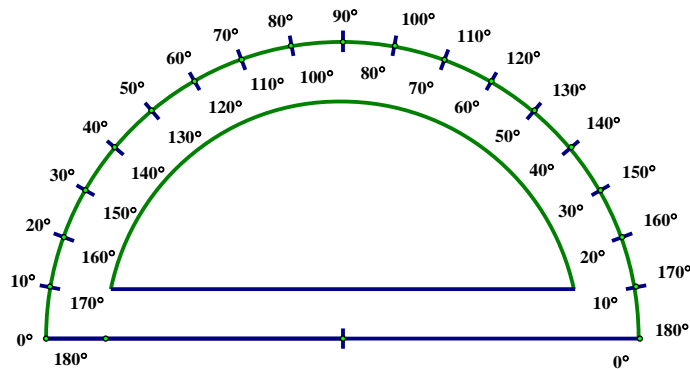
**Solve for  $y$ :**  $3x + 6y = 12$

**Solve for  $y$ :**  $3x = \frac{24}{y}$

**47. True or false:** If  $x$  and  $y$  are real numbers, then  $(x - y)^2 = x^2 - y^2$  \_\_\_\_\_

# Skills Review for Students Entering Geometry - Solutions

1. a)

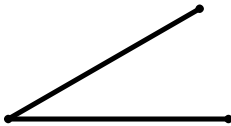


b) A protractor has two sets of degree markings, from 0 to 180 degrees, going in opposite directions, so that the protractor can be easily be used to measure angles that open to the left or to the right. The two scales allow the left or the right hand arm of the angle to be lined up with zero in order to measure the size of the angle.

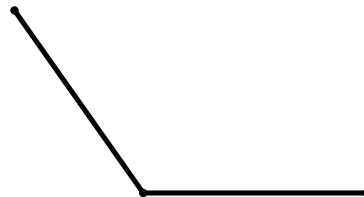
2.  $A = \frac{3}{4} \text{ in}; B = 1\frac{3}{8} \text{ in}; C = 2\frac{1}{2} \text{ in}$

3. Estimates will vary but should be within 20 degrees of actual measurements.  
Actual:  $35^\circ, 80^\circ, 90^\circ$

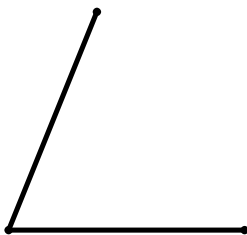
4. a) 30 degrees



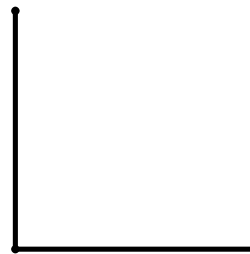
b) 125 degrees



c)  $68^\circ$



d)  $90^\circ$



5. a)  
b)  
c)

6. a) 534.79

b) 0.667

c) 8.7

7. a) A meter is longer than a yard.

b) 36 *inches*

c) 100 *cm*

d)  $3\frac{3}{4}$  *in*

e) 1.15 *meters*

f) i) 0.144 or  $\frac{19}{132}$  *miles*

ii) 63,360 *in*

g) 100,000 *cm*

h) 48 *glasses*

8. 384 *tiles*

9. 90

10.  $360^\circ$ ,  $90^\circ$

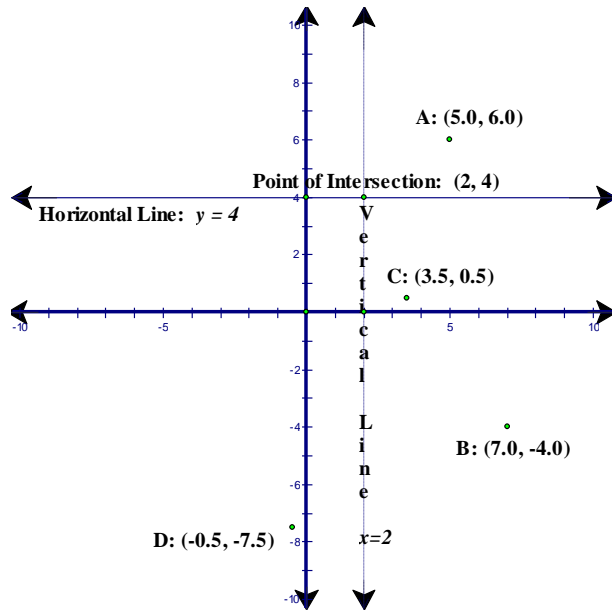
11. a)  $216 \text{ ft}^3$       b) 60 *ft*

12.  $12 \text{ m}^2$

13. a)  $225\pi$  or 707  $\text{cm}^2$     b)  $30\pi$  or 94.2 *cm*

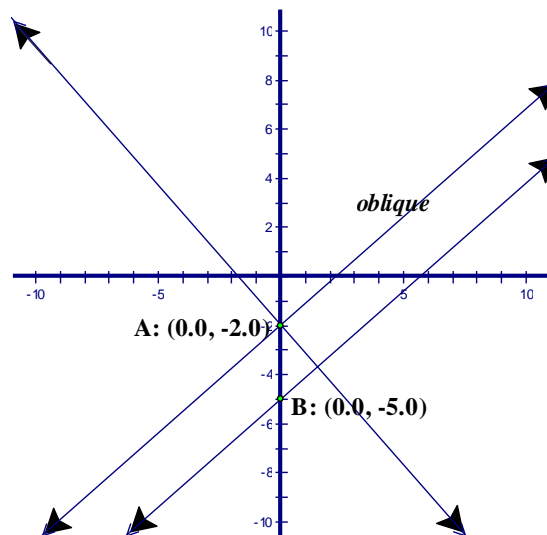
14.  $7\frac{1}{2}$

15.



16. Sample (answers will vary); See #15 above.

17. Sample (answers will vary):



18. a) 18

b) -18

c) 18

d) 15

e) 8.3

f) 7.8

g) 12

h) 2

i) 12

19. 30

20. 41

21. 41 inches

22. 4:5

23.  $3\frac{1}{2}^{\circ}\text{C/hr}$



24. a) i) 150, ii) 225, iii) 375

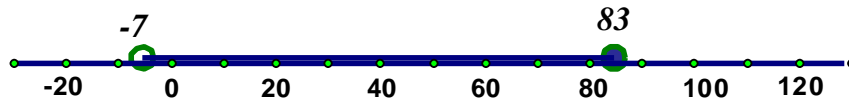
b) 375

c) 250, 400

25. a)

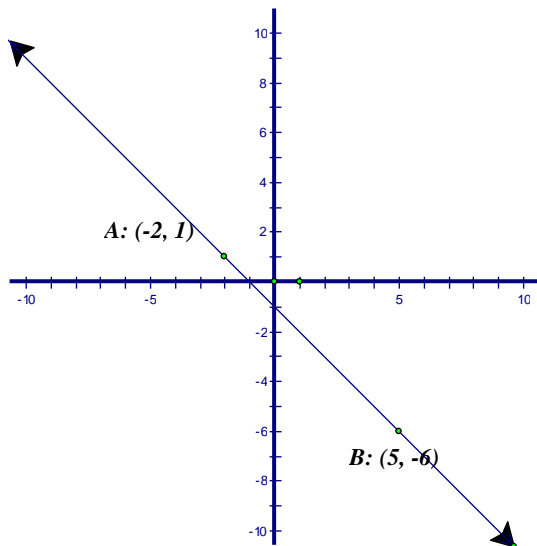


b)



26. a)  $y = -x - 1$

b)



c) -1

d) (0, -1)

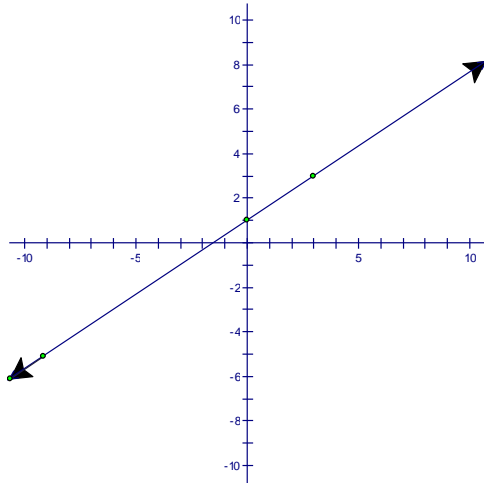
27.

x	y
3	$-\frac{4}{3}$
$23\frac{1}{2}$	$5\frac{1}{2}$
-2	-3
-29	-12

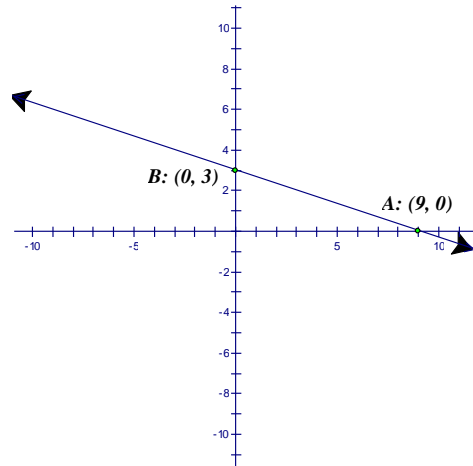
28. a) slope-intercept form  
 b) point-slope form  
 c) standard form

29. a) horizontal  
 b) oblique  
 c) vertical  
 d) oblique

30. a)  $y = \frac{2}{3}x + 1$

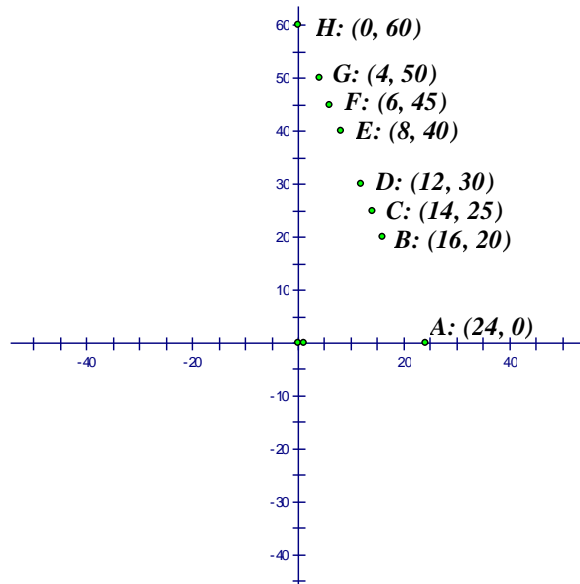


b)  $x + 3y = 9$



31. a) Sample answers:  $(0, 60), (4, 50), (6, 45), (8, 40), (12, 30), (14, 25), (16, 20), (24, 0)$

b)



c) yes

32.  $y = -5$

33.  $x = h$

34.  $\frac{-4}{3}$

35.  $\frac{-1}{3}$

36. a)  $\left(6\frac{2}{3}, 26\frac{2}{3}\right)$       b)  $(6, -2)$

37. a)  $\{2, 4, 6, 8, 10, 12, 14\}$

b)  $\{3, 6, 9, 12, 15\}$

c)  $\{2, 3, 4, 6, 8, 9, 10, 12, 14, 15\}$

d)  $\{6, 12\}$

38. Sample (answers will vary): money

39.

$$15 + 5x$$

$$st + rt$$

$$cd - 2d^2$$

40.

$$193 - 10x$$

$$345 - 9x$$

$$\frac{2x - 1}{3}$$

$$\frac{16}{15}$$

$$\frac{31}{40}$$

$$\frac{3}{20}$$

$$6x$$

$$9$$

$$13$$

41.

$$\frac{2}{5}$$

$$3\sqrt{2}$$

$$\frac{\sqrt{2}}{4}$$

$$x$$

$$4\pi r$$

$$3\sqrt{2}$$

$$2\sqrt{5}$$

$$5$$

$$x$$

$$5\sqrt{5}$$

$$30$$

$$2\sqrt{a+b}$$

$$ab$$

*simplified*

$$\frac{1}{3}\sqrt{a-b}$$

$$3x$$

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

*simplified*

42.

$$x(a+3)$$

$$6(b-5c)$$

$$\frac{1}{2}z(x+y)$$

43.

$$x^2 + 7x + 10$$

$$9a^2 - 4$$

$$m^2 - 2mn + n^2$$

44.

$$x = 101\frac{1}{2}$$

$$y = 77\frac{1}{7}$$

$$a = 14$$

$$x = 6$$

$$z = \frac{2}{17}$$

$$-32 < z < 58$$

$$-161 < q < -71$$

$$x = \pm 7$$

$$x = \pm 2\sqrt{3}$$

$$x = \pm \frac{5\sqrt{3}}{3}$$

$$w = -22, w = 12$$

$$x = 27\frac{1}{2}$$

45.  $m = \frac{7}{2}$

$$d = \frac{39}{10}$$

$$x = \pm\sqrt{30}$$

$$y = 110$$

$$w = 36$$

$$r = \frac{21}{\pi}$$

$$n = 3, 4$$

$$x = -4$$

$$b = \pm 5$$

46.

Solve for  $m$ :  $m = 15p$

Solve for  $x$ :  $x = 100$

Solve for  $w$ :  $w = \frac{A}{l}$

Solve for  $l$ :  $l = \frac{p - 2w}{2}$

Solve for  $y$ :  $y = -\frac{1}{2}x + 2$

Solve for  $y$ :  $y = \frac{8}{x}$

47. False