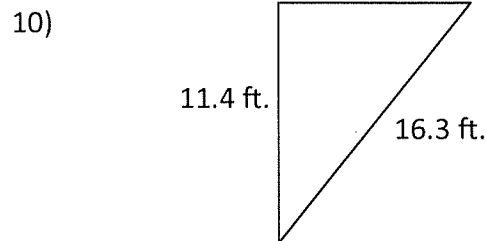
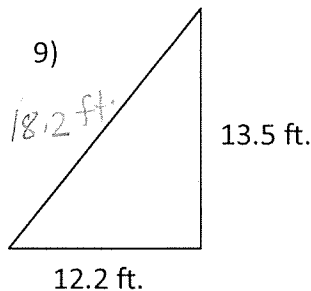
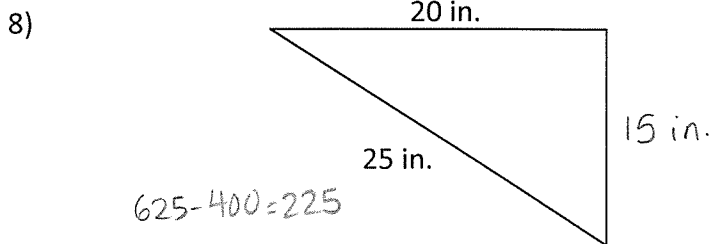
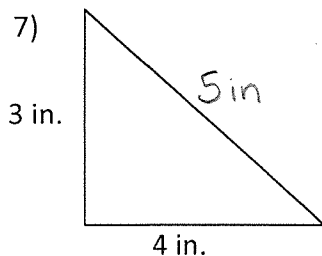


## Pythagorean Theorem (Chapter 11)

Directions: Determine whether these three side lengths form a right triangle. Show all work.

- |                                                         |                                                         |                                                       |
|---------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|
| 1) 11 in, 12 in, 15 in<br>$121 + 144 = 265 \neq 225$ No | 2) 18 m, 24 m, 30 m<br>$324 + 576 = 900 = 900$ Yes      | 3) 3cm, 4cm, 5cm<br>$9 + 16 = 25 = 25$ Yes            |
| 4) 5 ft, 6 ft, 8 ft<br>$25 + 36 = 61 \neq 64$ No        | 5) 13 cm, 15 cm, 20 cm<br>$169 + 225 = 394 \neq 400$ No | 6) 10 in, 24 in, 26 in<br>$100 + 576 = 676 = 676$ Yes |

Directions: Find the missing side length of the right triangles using the Pythagorean Theorem. Show all work. Round to the nearest hundredth where appropriate.



$148.84 + 182.25 = 331.09$

$129.96 + b^2 = 265.69$   
 $b = 11.7$

Directions: Find the distance between the following points. Round to the nearest hundredth where appropriate. Show all work.

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

11) (3, 4) and (7, 6)

$\sqrt{2^2 + 4^2} = \sqrt{20} = 4.47$

12) (-1, 4) and (3, 1)

$\sqrt{3^2 + 4^2} = \sqrt{25} = 5$

13) (2, -5) and (9, 8)

$\sqrt{13^2 + 7^2} = \sqrt{218} = 14.76$

14) (10, -6) and (-2, -4)

$\sqrt{2^2 + 12^2} = \sqrt{148} = 12.17$

15) (-2, -4) and (10, 10)

$\sqrt{14^2 + 12^2} = \sqrt{340} = 18.44$

16) (4, 4) and (3, 4)

$\sqrt{0^2 + 1^2} = \sqrt{1} = 1$

## Ratios, Rates and Percents (Chapter 6)

Directions: Answer the following question. Show all work. Round to the nearest hundredth where appropriate.

- 17) Maddie ran 9 miles in 74 minutes. What is her rate in ft/sec?

$$\frac{9 \text{ miles}}{74 \text{ min}} \cdot \frac{5280 \text{ ft.}}{1 \text{ mile}} = \frac{47,520 \text{ ft.}}{74 \text{ min}}, \frac{1 \text{ min}}{60 \text{ sec}} = 10.7 \text{ ft./sec.}$$

- 18) Facebook uploads 100,000 photos minute. How many photos are uploaded every day?

$$\frac{100,000}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{24 \text{ hr}}{1 \text{ day}} = 144,000,000/\text{day}$$

- 19) Superman is said to be faster than a speeding bullet. Bullets travel around 3000 feet per second. What is that speed in miles per hour?

$$\frac{3000 \text{ ft.}}{1 \text{ sec.}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr.}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft.}} = 2045 \text{ mph.}$$

- 20) Convert 24 feet/sec into miles/hour.

$$\frac{24 \text{ ft.}}{1 \text{ sec.}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft.}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr.}} = 16. \text{ mph}$$

- 21) Convert 500 miles/hour into miles/week.

$$\frac{500 \text{ miles}}{1 \text{ hr.}} \cdot \frac{24 \text{ hrs}}{1 \text{ day}} \cdot \frac{7 \text{ days}}{1 \text{ week}} = 84,000$$

16.36

Directions: Solve. Show all work. Round to the nearest hundredth or leave as a fraction.

22)  $\frac{10.4}{x} = \frac{5}{7}$

$$5x = 72.8$$

$$x = 14.56$$

23)  $\frac{x-1}{2} = \frac{4}{3}$

$$3x - 3 = 8$$

$$3x = 11$$

$$x = 11/3 = 3.\bar{6}$$

24)  $\frac{2x-3}{2} = \frac{1}{5}$

$$10x - 15 = 2$$

$$10x = 17$$

$$x = 17/10 = 1.7$$

25)  $\frac{10}{x+1} = \frac{5}{7}$

$$70 = 5x + 5$$

$$65 = 5x$$

$$13 = x$$

26)  $\frac{x-1}{3} = \frac{6}{7}$

$$7x - 7 = 18$$

$$7x = 25$$

$$x = 3.57$$

27)  $\frac{2}{9} = \frac{x-4}{5}$

$$10 = 9x - 36$$

$$46 = 9x$$

$$x = 5.1$$

Directions: Answer the following questions. Show all work. Round to the nearest hundredth where appropriate.

- 28) Dan's Camera City charges \$12.50 to develop and print 36 photos. At this rate, how much should 24 photos cost to develop and print?

$$\frac{12.50}{36} = \frac{\$}{24}$$

$$\$ = 8.33$$

- 29) A 90-ft tall building casts a 25-ft shadow. A nearby flagpole casts a shadow that is 10-ft long. How tall is the flagpole?

$$\frac{90}{25} = \frac{?}{10}$$

36 ft. tall flagpole

30) The scale of a map is 1 in: 150 mi. If there are 2,000 miles between Hellertown and El Paso, TX, how many inches are they apart on the map?

$$\frac{1 \text{ in}}{150 \text{ mi}} = \frac{? \text{ in}}{2000 \text{ mi}} \quad 2000 = 150 ?$$

2000 miles would be represented by 13.3 inches.

Directions: For the following questions, write a proportion or equation and solve. Show all work. Round to the nearest hundredth where appropriate.

31) 10% of what number is 15?  $\frac{10}{100} = \frac{15}{x} \quad x = 150$

32) 42 is what percent of 200?  $21\%$

33) 300 is 15% of what number?  $2000$

34) If 132 students out of 190 like math, about what percent of students like math?

$$\frac{132}{190} = 69\%$$

35) What percent of 42 is 76?

$$\frac{76}{42} = 180.95\% \quad \text{or} \quad 181\%$$

Directions: For the following questions, write a proportion or equation, solve, and then answer the question with words. Show all work. Round to the nearest hundredth where appropriate.

36) North Summit climbing gym is giving away \$3.00 climbing coupons. This coupon is for 25% off the entry cost to the gym. What is the original price for rock climbing at the gym?

$$\frac{3}{x} = \frac{25}{100} \quad \$12.$$

37) If the sale price of a coat is \$60 and it was on sale for 30% off, what was the original cost of the coat?

$$\frac{60}{x} = \frac{70}{100} \quad \frac{6000}{70} = \$85.71 \quad \text{or} \quad \$83.33 \text{ depending on version of study guide}$$

38) A t-shirt sells for \$30. If you have a 20% off coupon what is the sale price?

$$30 \cdot .8 = \$24$$

39) You and a date go to Red Robin and the bill is \$35.20. If you want to leave a 20% tip, how much of a tip do you leave?

$$35.20 \times .2 = \$7.04$$

40) Notability, my new favorite app for the iPad, was on 80% off sale for \$0.99. What was the original cost of the app?

$$\frac{.99}{x} = \frac{20}{100} \quad \$4.95$$

41) A John Grisham novel is on sale for \$17.49 at Barnes and Noble. This sale price is after a discount of 30% off. What is the regular price of the novel without the discount?

$$\frac{17.49}{x} = \frac{70}{100} \quad \$24.99$$

42) Ms. Catullo went shopping and bought a new pair of shoes for \$48. This included a 70% discount. What was the original price of the shoes? Show all work.

$$\frac{48}{x} = \frac{30}{100} \quad \$160$$

## Spatial Thinking (Chapter 8)

43) In the diagram below, the value of  $n = \underline{10.56}$ .

The acute angle is  $\underline{75.36^\circ}$  degrees.

The obtuse angle is  $\underline{104.72^\circ}$  degrees.

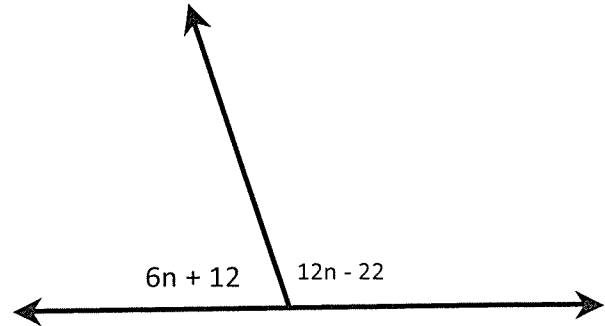
$$6n + 12 + 12n - 22 = 180$$

$$18n = 190$$

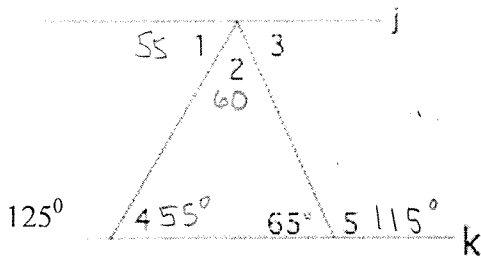
$$n = 10.56$$

$$6(10.56) + 12 = 75.36$$

$$12(10.56) - 22 = 104.72$$



44) In the diagram below, line  $j \parallel$  line  $k$ . Find the measure of the following angles.



$$m\angle 1 = \underline{55^\circ}$$

$$m\angle 2 = \underline{60^\circ}$$

$$m\angle 3 = \underline{65^\circ}$$

$$m\angle 4 = \underline{55^\circ}$$

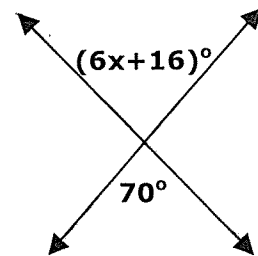
$$m\angle 5 = \underline{115^\circ}$$

45) In the diagram to the right, the value of  $x = \underline{9}$ .

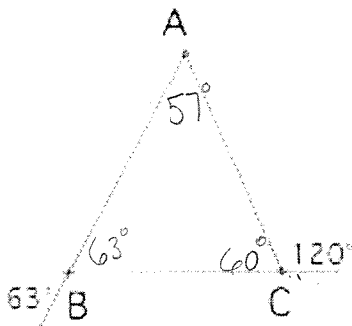
$$6x + 16 = 70$$

$$6x = 54$$

$$x = 9$$



46) Using the diagram below, find the measure of the following angles.

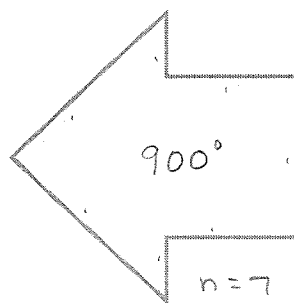
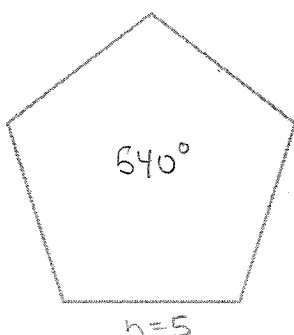
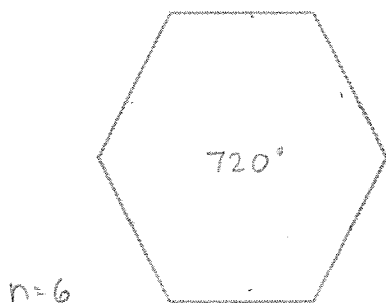


$$m\angle ABC = \underline{63^\circ}$$

$$m\angle BCA = \underline{60^\circ}$$

$$m\angle BAC = \underline{57^\circ}$$

47) Find the total number of interior degrees for the three shapes below. Write the total number of degrees inside each shape.



48) A polygon with 720 interior degrees has 6 sides.

49) A polygon with 1260 interior degrees has 9 sides.

50) A polygon with 900 interior degrees has 7 sides.

51) A polygon with 360 interior degrees has 4 sides.

52) Mr. Lloyd tried to answer the following question. "A polygon with ~~720~~ <sup>2160</sup> interior degrees has \_\_\_\_\_ sides." Was he successful?

$$\frac{2160}{180} = \frac{180(n-2)}{180}$$

No.  
Forgot to  
finish solving  
equation

$$12 = n$$

So A 12-gon has  
2160 interior degrees.

$$12 = n - 2$$

so  
n = 14  
not 12

## Formula Sheet

- 53)  $21^{\circ}$  Fahrenheit =  $\underline{-6.11^{\circ}}$  Celsius.  
54)  $21^{\circ}$  Celsius =  $\underline{69.8^{\circ}}$  Fahrenheit.  
55)  $220^{\circ}$  Fahrenheit =  $\underline{104.4^{\circ}}$  Celsius.  
56)  $25^{\circ}$  Celsius =  $\underline{77^{\circ}}$  Fahrenheit.  
57)  $-10^{\circ}$  Celsius =  $\underline{14^{\circ}}$  Fahrenheit.

## Linear Equations (Chapter 8)

Circle the correct answer for each question.

58. This table shows a relation between  $x$  and  $y$ . Which equation shows the same relation?

X	-1	0	1	2	3
Y	-2	1	4	7	10

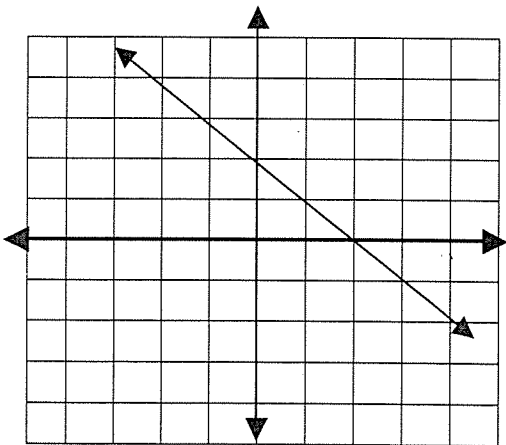
$+1$   
 $+3$   $y = 3x + 1$

- A.  $y = -3x$                       B.  $y = -3x + 1$   
C.  $y = 3x + 1$                       D.  $y = x + 3$

59. For which equation is  $(1, 5)$  a solution?

- A.  $y = 3x + 1$                       B.  $y = -x + 6$                       C.  $y = 2x + 2$                       D.  $y = 2x - 3$

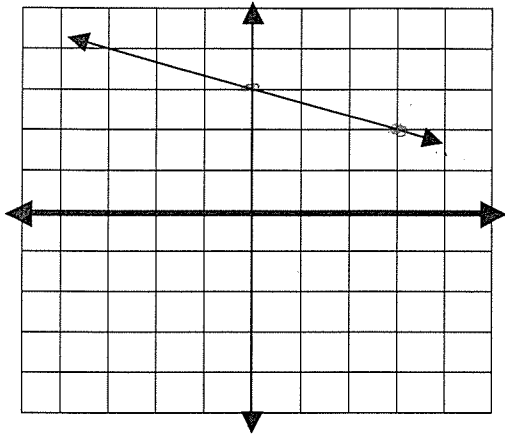
60. Which is the linear equation for this graph?



- A.  $y = -2x + 1$   
B.  $y = 2x - 1$   
C.  $y = x + 2$   
D.  $y = -x + 2$

$b = 2$  negative slope

Look carefully at the following graphed line and then answer the following three questions.



61. What is the slope of the line?

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

62. What is the y-intercept of the line?

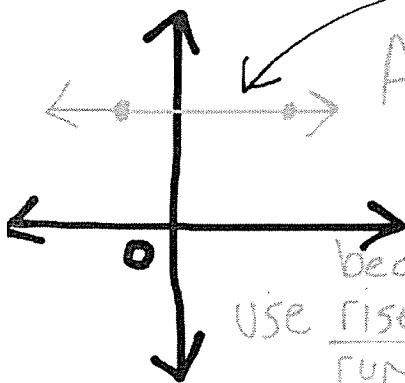
$$3$$

63. What is the equation of the line?

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

64. A student was asked to find the slope of a horizontal line. Below you'll see the question, the graph and their answer. Read the answer carefully and write a sentence or two agreeing or disagreeing with the answer given by the student.

Q: Find the slope of this horizontal line



A: The slope of this line is zero because if we use  $\frac{\text{rise}}{\text{run}}$ , the fraction would be  $\frac{0}{3}$  which equals zero!

The student is correct the the rise is 0 no matter what the change in x is - and 0 over any number equals 0.

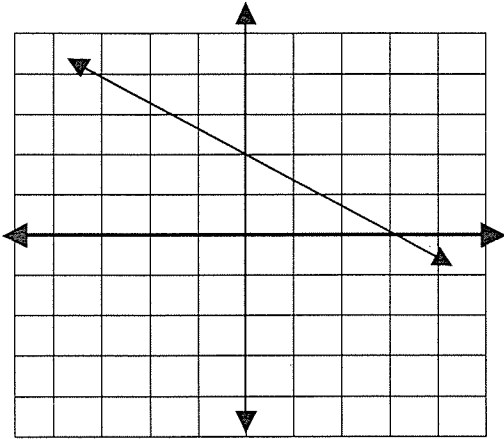
65. Find the slope of the line through (-6, -2) and (2, 3).  $\frac{3 - (-2)}{2 - (-6)} = \frac{3+2}{2+6} = \frac{5}{8}$

66. Find the slope of the line through (-6, 2) and (2, 30).  $\frac{30-2}{2+6} = \frac{28}{8} = \frac{7}{2}$

67. Find the slope of the line through (-5, 8) and (-2, 8).  $\frac{8-8}{-2+5} = \frac{0}{3}$

68. Find the slope of the line through (-12, -200) and (20, -232).  $\frac{-232+200}{20+12} = \frac{-32}{32} = -1$

69. Which set of ordered pairs all lie on this line?



- A. (0, 2), (3, 0), (-3, 4)
- B. (2, 0), (0, 3), (4, -3)
- C. (0, -2), (-3, 0), (3, -4)
- D. (-2, 0), (0, -3), (-4, 3)

70. Complete the following table. Then write an equation to show the relationship in the table.

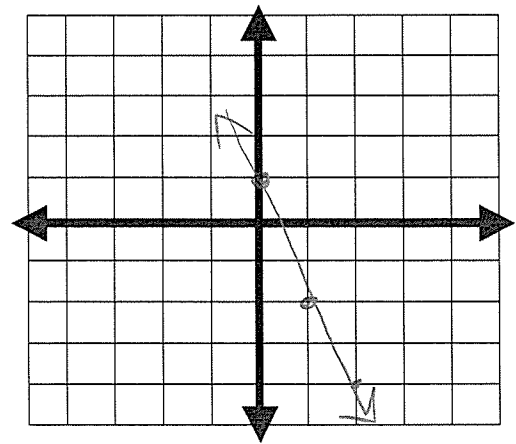
x	y
-3	11
-2	8
-1	5
0	2
1	-1
2	-4
3	-7

$m = \frac{-3}{+1} = -3$

Equation:  $y = -3x + 2$

71. Graph  $y = -3x + 1$  using a table of values. Show all work.

x	$y = -3x + 1$	y
0		1
1		-2
2		-5





72. Given the function  $y = 2x + 4$ , which set of numbers completes the table?

x	Y
2	8
3	10
4	12

A. [4, 6, 8]

B. [8, 10, 12]

C. [12, 18, 24]

Find the *slope* and the *y-intercept* of the line with the given equation.

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

slope = 1/2

y-intercept = 4

74.  $y = -3x$

slope = -3

y-intercept = 0

75.  $y = 8$

slope = 0

y-intercept = 8

76.  $y = \frac{-1}{4}x - 3$

slope = -1/4

y-intercept = -3

77.  $y = -x$

slope = -1

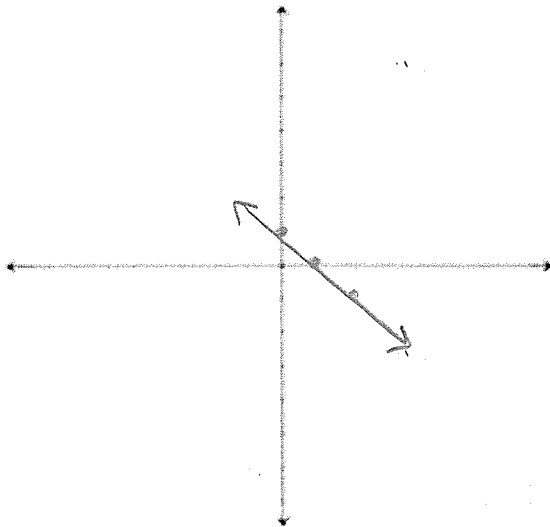
y-intercept = 0

78.  $y = 8 - 2x$

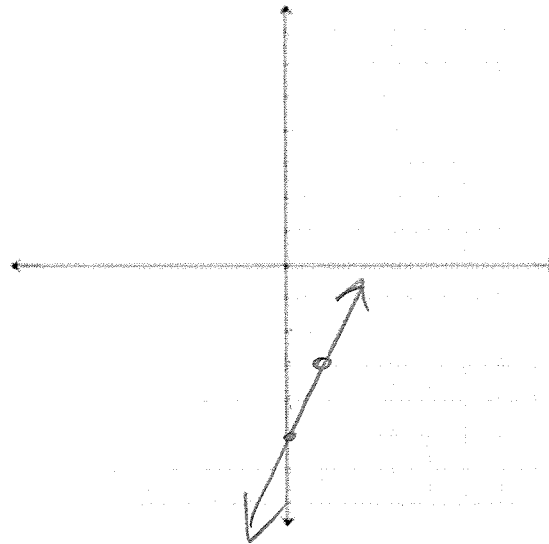
slope = -2

y-intercept = 8

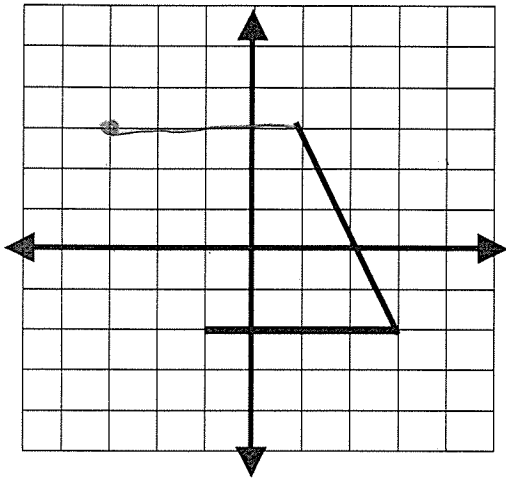
79. Graph the relationship  $y = -x + 1$ ?



80. Graph the relationship  $y = 2x - 5$ ?



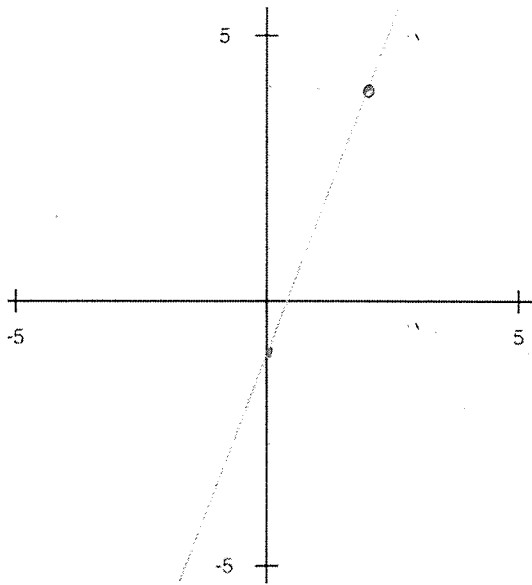
81. Complete the drawing of the parallelogram. Which of the following is the location of the missing vertex of a parallelogram?



- A. (3, -3)
- B. (-3, 3)**
- C. (-4, 3)
- D. (3, -4)

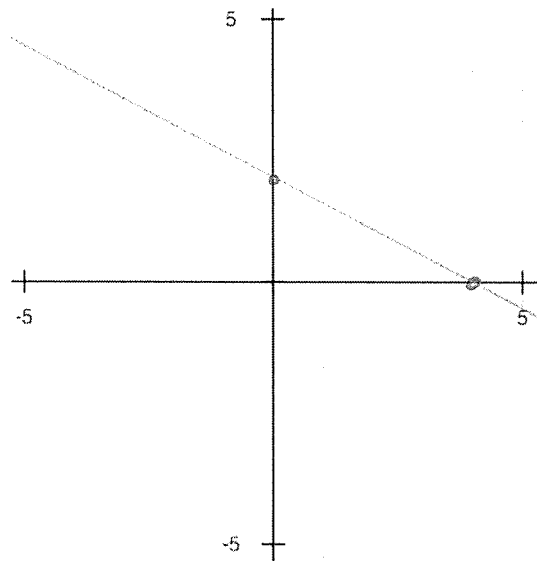
Write the equation of the following lines in  $y = mx + b$  form.

82.



Equation:  $y = \frac{5}{2}x - 1$

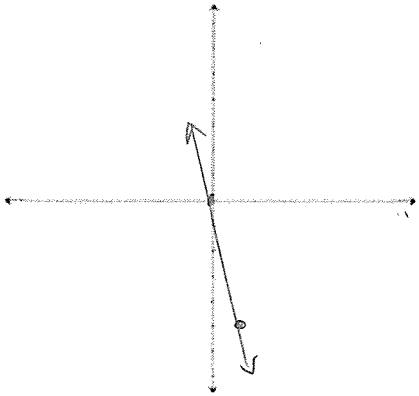
83.



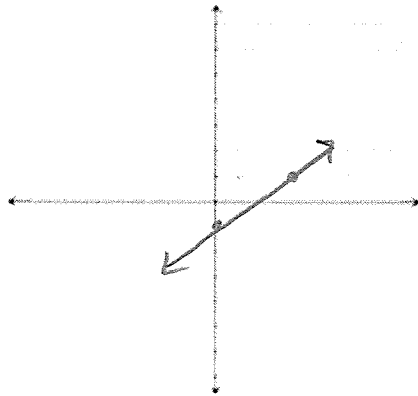
Equation:  $y = -\frac{1}{2}x + 2$

Graph each (you can make a *table of values* or use  $y = mx + b$ ).

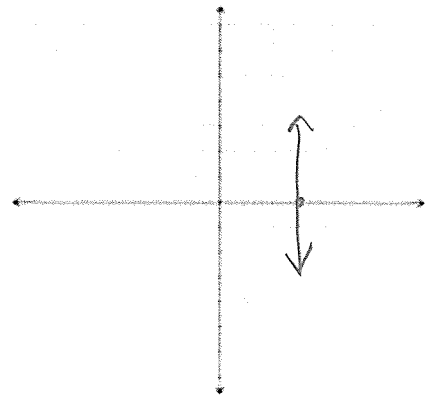
84.  $y = -5x$



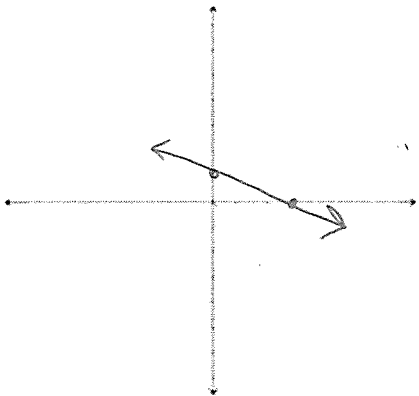
85.  $y = \frac{2}{3}x - 1$



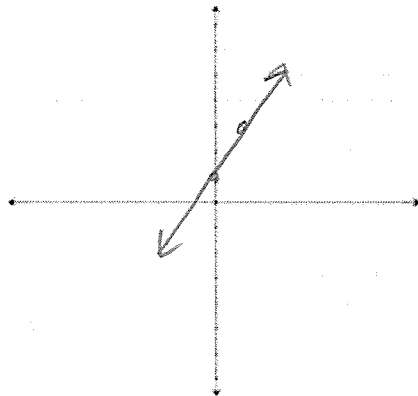
86.  $x = 3$



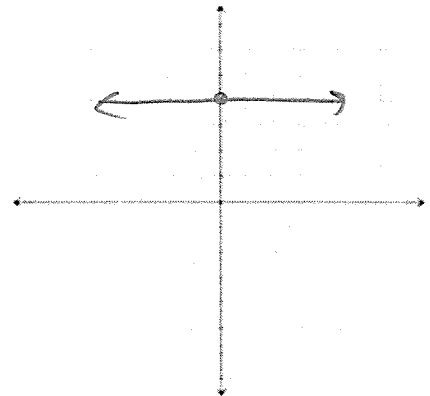
87.  $y = -\frac{1}{3}x + 1$



88.  $y = 2x + 1$



89.  $y = 4$



## Measures of Central Tendency – Data Analysis and Graphs

Scores on and English Test

Stem	Leaves
5	6 8
6	5 7 8 8 9
7	0 2 6 6 7 7 8 8 9
8	0 2 2 2 4 5 6 7 8
9	2 3 9

Key  $5|6 = 56$

90. What was the median test score? 76

91. What was the mode test score? 82

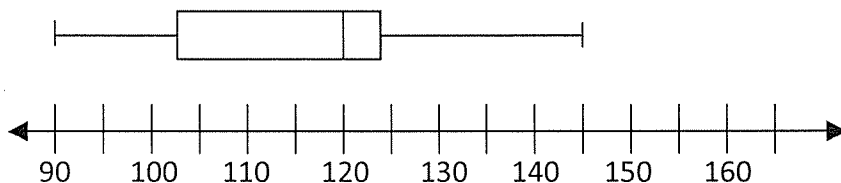
92. How many students scored in the 90's? 3

93. What was the range of the test scores? 99

$$\begin{array}{r} 99 \\ - 56 \\ \hline 43 \end{array}$$

43

Weight of 40 students (in pounds)



94. What is the maximum weight? 145 lbs.

95. What is the median weight? 120 lbs.

96. What is the upper quartile (a.k.a. third quartile) of the weights? 125 lbs.

97. What is the range of the weights?  $145 - 90 = 55$  lbs.

98. What percent of students weigh between 103 and 145 pounds? 75%

99. What fraction of students weigh more than 120 pounds?  $\frac{1}{2}$

100. How many students weigh between 90 and 103 pounds?

25% of 40 = 10 students

## Scientific Notation

Directions: For the following section, write the numbers given either in scientific notation or standard notation as requested.

101) Write the number 34,000,000 in scientific notation.  $3.4 \times 10^7$

102) Write the number 0.045 in scientific notation.  $4.5 \times 10^{-2}$

103) Write the number 543 in scientific notation.  $5.43 \times 10^2$

104) Write the number -6,000,000,000,000,000 in scientific notation.  
 $-6. \times 10^{15}$

105) Write the number  $4.5 \times 10^3$  in standard form. 4500

106) Write the number  $9.98 \times 10^5$  in standard form. 998,000

107) Write the number  $1.52 \times 10^{-2}$  in standard form. .0152

108) Order the numbers in the following list of 4 numbers from least to greatest and write them on the 4 lines provided below.

$5.4 \times 10^4$	$3.4 \times 10^5$	$5.4 \times 10^2$	$1.23 \times 10^{-10}$
<u><math>1.23 \times 10^{-10}</math></u>	<u><math>5.4 \times 10^2</math></u>	<u><math>5.4 \times 10^4</math></u>	<u><math>3.4 \times 10^5</math></u>
least			greatest

## Probability

109. A bag contains 8 red marbles and 12 yellow marbles. If Jason removes one marble from the bag without looking, what is the probability that he will select a yellow marble?

$$\frac{12}{20} = \frac{3}{5}$$

110. A restaurant has five different sandwiches and four side dishes. Answer the question in the image below.

MENU	
SANDWICHES	SIDE DISHES
Cheese	French Fries
Turkey	Potato Chips
Fish	Onion Rings
Tuna	Fried Mushrooms
Chicken	

How many different combinations are possible if a person orders one sandwich and one side dish?

20 different combinations

111. Imagine rolling 3 dice at the same time. What is the probability of rolling a 3 on the first die, an odd number on the second die, and a 6 on the third die?

$$\frac{1}{6} \cdot \frac{1}{2} \cdot \frac{1}{6} = \frac{1}{72}$$

112. What is the probability of tossing a head on a coin and rolling a 1 on a number cube?

$$\frac{1}{2} \cdot \frac{1}{6} = \frac{1}{12}$$

113. What is the probability of rolling a pair of 1's when rolling a pair of dice?

$$\frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$$

114. What is the probability of flipping a coin 5 times and getting a tail each time?

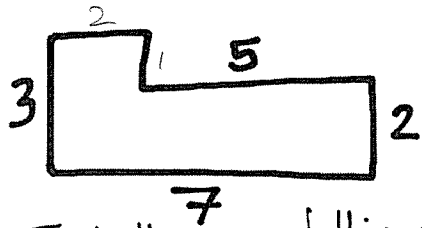
$$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{32}$$

115. What is the probability of having the locker combination 12-24-36?

$$\frac{1}{50} \cdot \frac{1}{50} \cdot \frac{1}{50} = \frac{1}{125,000}$$

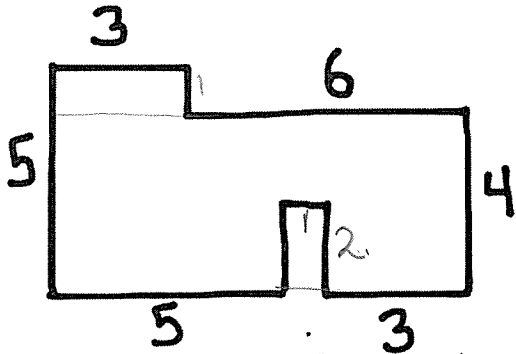
$$\frac{1}{125,000}$$

Geometry



$$\begin{array}{r} 2 \times 7 = 14 \\ 1 \times 2 = 2 \\ \hline 16 \text{ units}^2 \end{array}$$

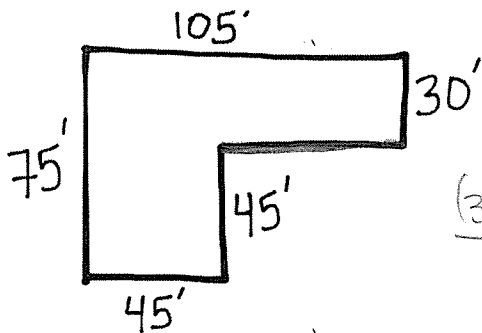
Find the area of this shape.



$$\begin{array}{r} 4 \times 9 = 36 \\ + 1 \times 3 = 3 \\ - 1 \times 2 = 2 \\ \hline 37 \text{ units}^2 \end{array}$$

Need more info

FIND THE AREA OF THIS SHAPE.

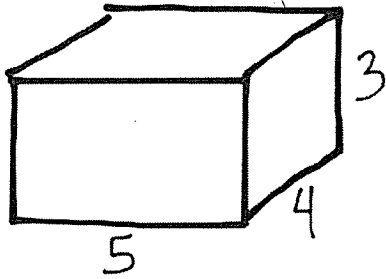


$$\frac{(360 \text{ feet})}{10 \text{ feet}} (\$21) = 36 \cdot 21 = 756$$

You want to find the cost to put a fence around this yard. Fencing costs \$21 for 10 foot section.

How many 10 foot sections do you need? 36

What is the total cost of all the fencing? \$ 756



$$\text{Volume} = \underline{60} \text{ units}^3$$

$$\text{Surface Area} = \underline{94} \text{ units}^2$$

Which measure, Volume or Surface Area, would you use if you want to fill the box? Volume

Find the surface area of the following 3 objects

