May 20, 2019, Monday

(x, y)

Identify the vertex, the axis of symmetry, create a table, then graph.
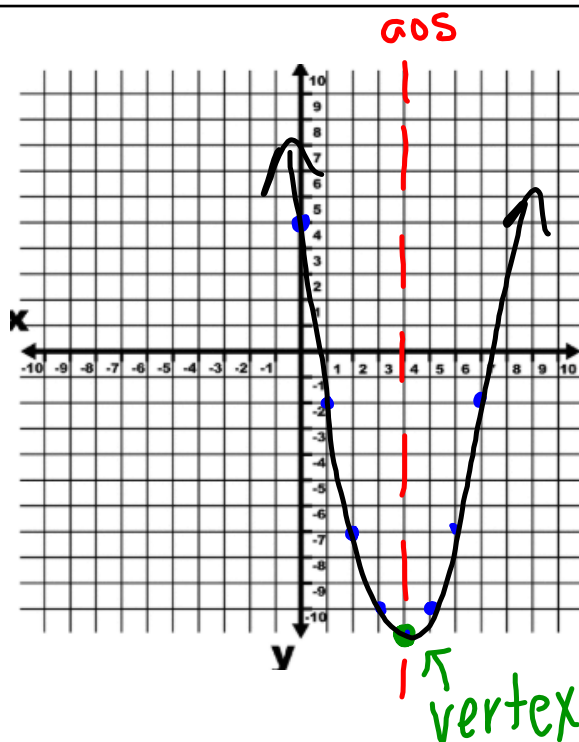
. . .

$y = x^2 - 8x + 5$

$a = 1$
$b = -8$
$c = 5$

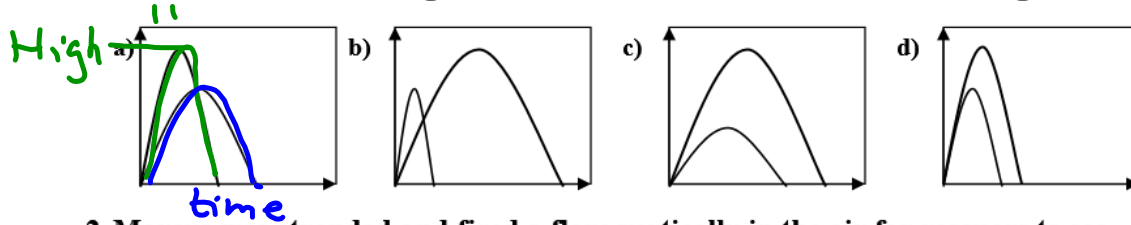$X = -\frac{b}{2a} = \frac{-8}{2(1)} = 4 \leftarrow aos$

$Vertex = (4, -11)$

$y = 4^2 - 8(4) + 5$

aos

vertex

QUADRATIC FUNCTIONS REVIEW

_____ 1. Choose the graph that best identifies the following situation: Maya and Erin were having a contest to see who could throw a ball higher into the air. Maya was able to throw the ball higher than Erin, but Erin's ball took much longer to land.

High →   a)   b)   c)   d)

time

_____ 2. Marcus was stranded and fired a flare vertically in the air for rescuers to see. Use the provided graph to choose which description matches the height of the flare over time.

a) Marcus fired the flare from the ground and it reached it's maximum height after 5 seconds.

b) The flare was fired from a tree 5 feet above the ground, and reached a maximum height of 200 feet.

c) Marcus's flare reached a height of 100 feet after 2.5 seconds.

d) The flare reached a maximum height of 200 feet after 2.5 seconds and stayed in the air for 5 seconds.

(2.5, 200)

Height

(5,0)

Time
2.5
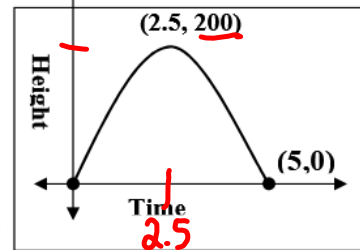
_____ 3. Choose the graph that best identifies the following situation: Charlie was practicing his free throw shooting. On his first shot attempt the ball got stuck between the rim and the backboard.

a)   b)   c)   d)

Rim

STUCK
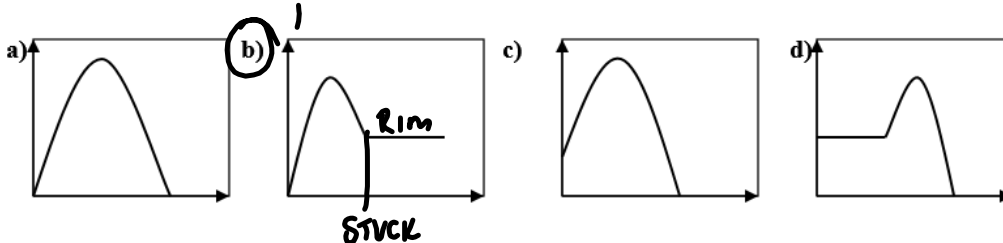
For questions 4 and 5 refer to the provided graph:

_____ 4. What is the initial value of the graph?

    a) (0,6) STARTING!

    b) 6

    c) 18

    d) 0

(5, 18)

18

6   (0, 6)

(12.5, 0)

X=0

_____ 5. What is the maximum value?

    a) 6

    b) 12.5

    c) (5,18)

    d) 18
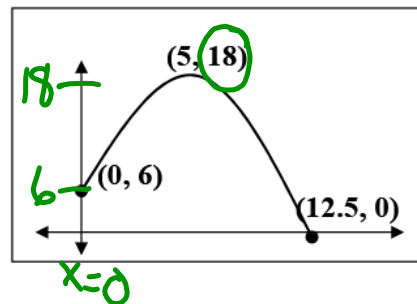
6. Find the coordinates of the vertex of the graph of $y = 3x^2 - 6$. Identify the vertex as a maximum of a minimum?

Handwritten: $y = 3x^2 + 0x - 6$ a is $+$, up a is $-$, down $a = 3$ $X = -\frac{b}{2a} = \frac{-0}{2(3)}$ $X = 0$ $y = 3(0)^2 - 6 = -6$ $(0, -6)$

a) (0,-6); maximum

c) (0,-6); minimum

b) (-6,0); minimum

d) (6, 0); minimum

7. If the vertex of a quadratic graph is at the point (4,5), then the axis of symmetry?

a) (4, 5)

c) x = 4

b) y = 4

d) x = 5

B 8. Farmer John wants to build a new pen for his horses. He has exactly 120 yards of fencing to use. What is the largest area he can build the pen with?

a) 3600 yd²

c) 30 yd

b) 900 yd²

d) 30 yd by 30 yd

A 9. CJ plans to remodel and expand his home. It is currently 40 meters by 50 meters, and he wants to expand the house uniformly on his plot of land to cover an area of 2475 m². How much did he expand the measurements of his home by?

a) 5 meters

c) 2.5 meters

b) 45 meters by 55 meters

d) 10 meters

D 10. Sicily is planning to build a porch with railing against her house. She only has 200 feet of railing to use. What is the largest space her porch can cover?
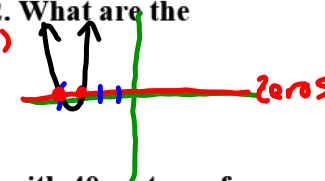
a) 1500 ft²

c) 2500 ft²

b) 10,000 ft²

d) 5000 ft²

11. The length of a rectangle is 5 less than twice the width. What is the equation for the area of the rectangle?

Handwritten: $l = 2w - 5$ $A = l \cdot w$ $A = (2w - 5) w$

a) w(5 − 2w)

c) 2w + 2(2w - 5)

b) 2w + 2(5-2w)

d) w(2w - 5)

12. The equation of a quadratic graph is given as $y = x^2 + 7x + 12$. What are the zeros of the graph?

Handwritten: answers Solutions x-intercepts

a) {3,4}

c) {(3,0), (4, 0)}

b) {-3, -4}

d) 12

For questions 13 and 14: Mrs. Land wants to enclose her rectangular yard with 40 meters of ending.

A 13. She uses her house as one side of the rectangle?

a) 200 m²

c) 100 m²

b) 1600 m²

d) 400 m²

C 14. She doesn't use her house as one side of the fencing?

a) 200 m²

c) 100 m²

b) 1600 m²

d) 400 m²

For questions 15 – 20: The height of a ball is given by the following equation, $h(t) = -16t^2 + 40t + 6$, where t is the time in seconds and h is the height of the ball in feet.

6 15. At what height is the ball released at? $t=0$ $h(0) = -16(0)^2 + 40(0) + 6 = 6$

30 16. How high is the ball after 1 second? $h(1) = -16(1)^2 + 40(1) + 6 = 30$

31 17. What is the **maximum height?** Find aos, $x = \frac{-b}{2a} = \frac{-40}{2(-16)} = 1.25$ then y

1.25 18. How long does it take to reach the maximum height? $y = -16(1.25)^2 + 40(1.25) + 6$ $y = 31$

x part of vertex

2.6 19. How long is the ball in the air for? $h=0$ $0 = -16t^2 + 40t + 6$ graphing

.35, 2.12 20. When is the ball at a height of 18 ft? $18 = -16t^2 + 40t + 6$ $t = 2.6$

For questions 21 – 24: A diver dives straight down off a diving board with the following equation, $h(t) = -9.8t^2 - 3t + 40$, where t is the time in seconds and h is the height of the diver in feet.

40 21. How high is the diving board? $t=0$ $h(0) = -9.8(0) - 3(0) + 40$ $h(0) = 40$ $t=0$

-.15 22. What is the axis of symmetry? $x = \frac{-b}{2a} = \frac{-3}{2(-9.8)} =$

1.873 23. When will the diver hit the pool? $40 = -9.8t^2 - 3t + 40$ -40 -40 $0 = -9.8t^2 - 3t$ $0 = -9.8t^2 - 3t + 40$

-2.2, 2 24. When will the diver have fallen 5 feet from the board? $+5$ $+5$ $0 = -9.8t^2 - 3t + 45$ No negative time

For questions 25 – 29: A concert promoter profit is based on the price of tickets in the following function, $p(x) = -3x^2 + 240x - 4500$ where p is the profit in **hundreds** of dollars and t is the ticket price in dollars.

-4500 25. What is the profit if the ticket price is zero? $p(0) = -3(0)^2 + 240(0) - 4500$

40 26. What is the ideal ticket price to make the most money? $aos = \frac{-240}{2(-3)}$

31.84, 48.16 27. How much will the promoter charge for tickets if he wants to make $10,000? $100 = -3x^2 + 240x - 4500$ -100 -100 $0 = -3x^2 + 240x - 4600$

$3000 28. What is the maximum profit the promoter can make?

30 to 50 29. Between which ticket prices must the promoter charge to make a profit? $\rightarrow p(40) = -3(40)^2 + 240(40) - 4500$

$$18 = -16t^2 + 40t + 6$$
$$-18 \qquad\qquad -18$$
$$0 = -16t^2 + 40t - 12$$

May 22, 2019, Tuesday

Are the following exponential growth or exponential decay graphs?

1) $y = -2 \cdot 2^x$

G

2) $y = \frac{1}{2} \cdot 5^x$

G

3) $y = -\frac{1}{3} \cdot \left(\frac{1}{2}\right)^x$

D

4) $y = 5 \cdot \left(\frac{1}{2}\right)^x$

D

5) $y = 5 \cdot 2^x$

G

6) $y = \frac{1}{4} \cdot \left(\frac{1}{7}\right)^x$

D

7) $y = 2 \cdot 3^x$

G

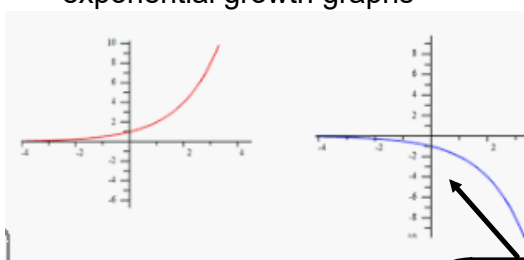8) $y = -\frac{1}{2} \cdot \left(\frac{1}{2}\right)^x$

D

9) $y = -\frac{1}{2} \cdot 2^x$

G

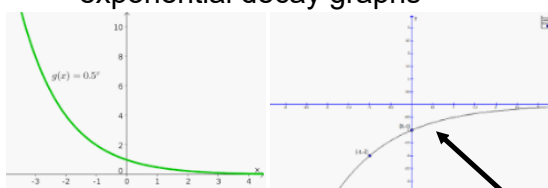10) $y = 2 \cdot \left(\frac{1}{2}\right)^x$

D

exponential growth graphs

this is a "reflection" of exponential growth

exponential decay graphs

this is a "reflection" of exponential decay

6

Exponential Function Review   Name:_____
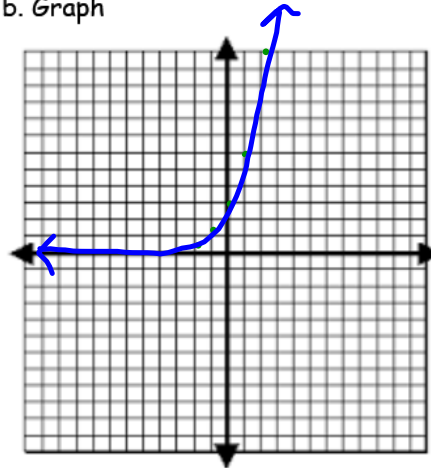   Date:_____

Graph the following functions, identify if it represents exponential growth or decay and identify Domain and Range.

1. $y = 3 \cdot 2^x$ $y = 3 \cdot 2^{-2} = 0.75$
                          $y = 3 \cdot 2^{-1} = 1.5$

   a. Table   b. Graph

x	-2	-1	0	1	2	3
y	0.75	1.5	3	6	12	24

   c. **Growth** or Decay (circle one)

   d. Domain: $\mathbb{R}$ or $(-\infty, \infty)$

   e. Range: $(0, \infty)$

2. $y = 4 \cdot (1/2)^x$ b. Graph

   a. Table

x	-3	-2	-1	0	1	2
y	32	16	8	4	2	1
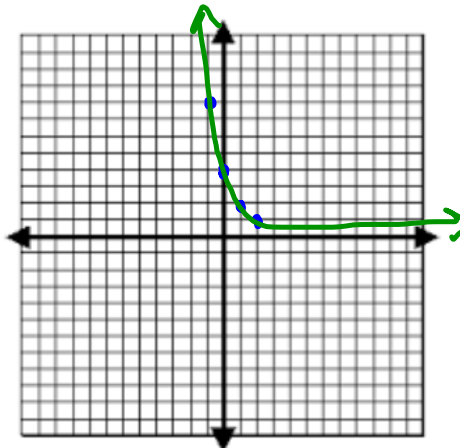
   c. Growth or **Decay** (circle one)

   d. Domain: $\mathbb{R}$

   e. Range: $(0, \infty)$

Find the base (b) value for the given situations:

3. Something is decaying each year at a rate of 17%. (**Hint:** which mini-formula should you use to find b?)

   b = $1 - .17$
       $100\% - 17\%$

Exponential Function Test Review

4. Something is growing each month at a rate of 6%.

b = $1 + .06$

5. **Each of these problem situations and table involves either a linear function or an exponential function. Decide whether it is linear or exponential. Then, write a y = · · · equation**

   a. $5,000 is placed in a savings account. Each year, the account value grows by 7%. Write equations for finding the account value after x years.

   Circle one: Linear or Exponential? $y = 5000(1+.07)^x$

   b.

x	0	1	2	3	4	5	6	7
y	5	10	15	20	25	30	35	40

   Circle one: Linear or Exponential? $y = 5x + 5$

6. 7. You buy a house for $130,000. Its value increases at a rate of 6% per year. Write an equation that models this situation, and find the value of your house after 10 years.

a.) Identify the initial amount (a).   b.) **Growth** or **Decay** (circle one)

   $130,000$

c.) Growth/~~Decay~~ Factor (b)
   $.06$

d.) Exponential Equation (y = a · bˣ) $y = 130000(1+.06)^x$

e.) ~~Original Problem Units:~~ $y = 130000(1+.06)^{10} = ?$
   Value at 10 yrs

Exponential Function Test Review

f.) Value of house after 10 years (**Hint: don't forget that you may need to check your units before using your equation!**):

$$y = 130000(1 + .06)^{10} = 232810$$

7. You buy a computer for \$3,000. Its value depreciates by 8% every month. How much is your computer worth after 3 years?
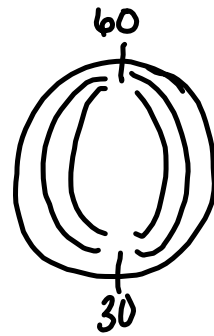
$$3 \cdot 12 = 36 \text{ mo}$$

$$y = 3000(1 - .08)^{36} = \$149.10$$

8. In a laboratory, they were testing a certain bacteria. They started with 50 bacteria and they noticed it triples every 30 minutes. How many will exist after 2 hour?

$$4 = 30\text{mins} \quad y = 50(3)^4 = 4050$$

60

30

9. **Simplify each of the below polynomials:**

$(4y^2x + 3ax^2 - 5x) + (2y^2x - 5yx^2 + 7x)$	b) $(4m^2 - 2m + 3) + (3m^2 + 5m - 3)$
$6y^2x + 3ax^2 + 2x - 5yx^2$	$m^2 + 3m$
$3y^2(2x^2 - 5yx + 9)$	d) $(2c - d)(3c + a)$
$6x^2y^2 - 15y^3x + 27y^2$	$6c^2 + 2ca - 3dc - da$ $6c^2 + 2ac - 3cd - ad$

usually variable will be in alphebetical order

Exponential Function Test Review

10. Simplify the below exponents:

a) $(x^{-3} \cdot x^2)^{-2}$

$X^{-3(-2)} \cdot X^{2(-2)}$

$X^6 \cdot X^{-4}$

$X^{6+-4} = X^2$

b) $(xy)^3 (x^2 y^2)^3$

$X^3 y^3 X^6 y^6$

$X^{3+6} y^{3+6}$

$X^9 y^9$

c) $(p^2 gx)^0$

$p^{2\cdot0} g^{1\cdot0} x^{1\cdot0}$

$p^0 g^0 x^0 = 1 \cdot 1 \cdot 1 = 1$

The heights, in inches, of 12 students are listed below.

61, 67, 72, 62, 65, 59, 60, 79, 60, 61, 64, 63

Which statement best describes the spread of these data?

(1) The set of data is evenly spread.

(2) The median of the data is 59.5.

(3) The set of data is skewed because 59 is the only value below 60.

(4) 79 is an outlier, which would affect the standard deviation of these data.

59 60 60 61 61 62 63 64 65 67 72 79

$$\frac{62+63}{2} = 62.5$$

79

59 60 61 62 63 64 65 67 72

May 22, 2019, Wednesday
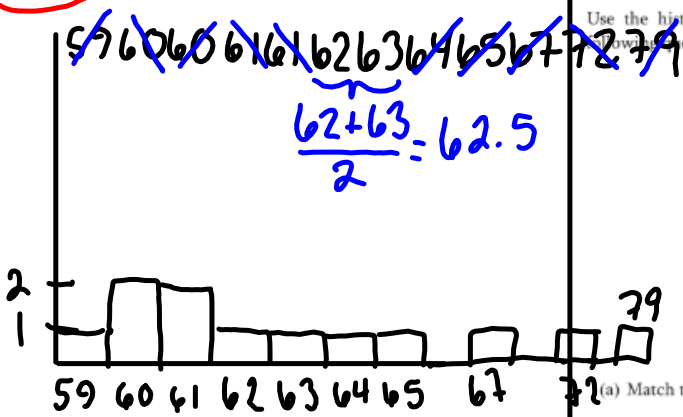
Use the histogram of 90 observations generated by R given below to answer the following questions.

Histogram of b
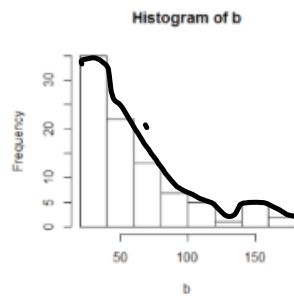
(a) Match the name in the left column with the correct number in the right column.

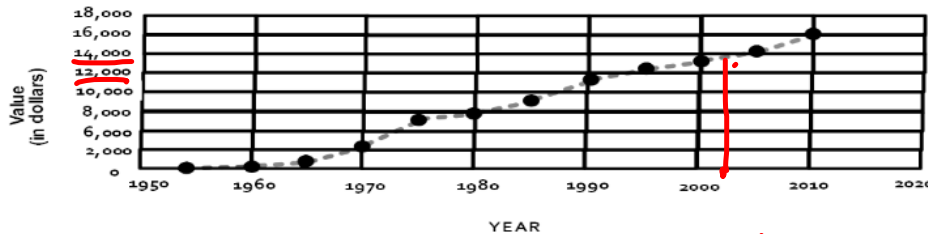|	
sample median	57.5
sample mean	37.7
sample standard deviation	67.3

(b) Describe the shape of the distribution.

Skewed right

Algebra I EOC
Practice #25

S-ID....Interpret displays of data to answer questions about the data set(s) (e.g., identify pattern, trends, and/or outliers in a data set.)
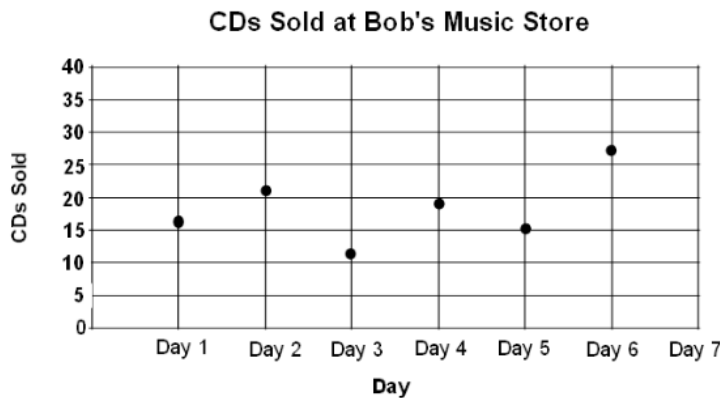
1. The graph below shows the value of a watch over many years.

What is a reasonable estimate of the value of the watch in 2002?

A. 14,100
B. 13, 500
C. 12, 500
D. 12, 000

2. The scatter plot shows the number of CD's sold in 7 days at Bob's Music Store.
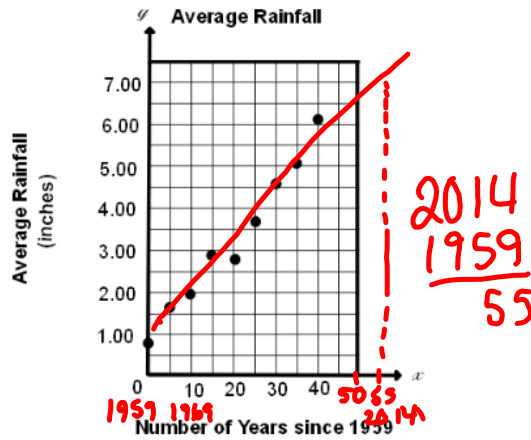
CDs Sold at Bob's Music Store

16,21, 11, 19, 15, 27

11, 15, 16, 19, 21, 27

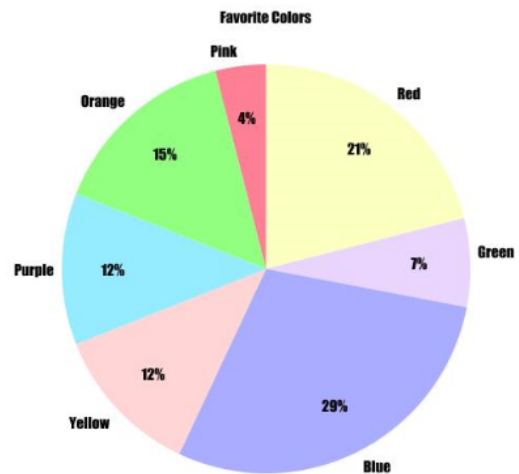For day seven, which number of CD's sold would be considered an outlier?

A. 9
B. 10
C. 25
D. 40
E. 27

3. The average rainfall, over a period of years, is shown in the graph below.

Average Rainfall

(handwritten, red)
2014
1959
───
55

(handwritten along x-axis, red) 1959 1969   50 65 2014

If the trend continues, what is the best prediction of the average rainfall in 2014?

A. 8.1 inches
B. 4.7 inches
C. 5.9 inches
D. 9.8 inches

(handwritten, red) E. 7 in

Favorite Colors

Pink 4%
Orange 15%
Red 21%
Green 7%
Blue 29%
Yellow 12%
Purple 12%

4. A total of 400 students were surveyed about their favorite color. The circle graph shows the percentage of each color students chose.

Which statement is **NOT** supported by the data displayed in the graph?

A. A little more than half the students chose either blue, orange, or green as their favorite color.

B. Green was chosen as the favorite color by more than half the number of students as purple.

C. Blue was the favorite color of 29 students. *(handwritten, red)* 400(.29) = 116

D. Yellow and pink combined were chosen by more students than orange.

Algebra I EOC
Practice #26

1. The mean amount of apples purchased at a grocery store daily is 108 apples. What is the new mean if the amount of apples purchased triples?

   A. 108
   B. 216
   C. 324
   D. There will not be a change.

   $\times 108$
   $\underline{3}$
   324

2. Vanessa has 17 quarters, 8 dimes, 15 pennies, and 14 nickels in a piggy bank. Which of the following measures of central tendency will change if she spends 4 quarters to get a soft drink?

   $17+8+15+14$
   $\overline{4}$
   $(3+8+15+14)$
   $\overline{4}$

   A. mean
   B. median
   C. mode
   D. None will change

   17 13 9 15 14
   Q O P N
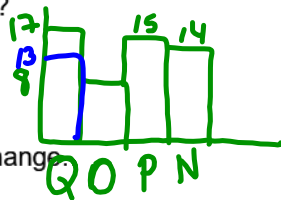
3. The range of a set of data is 15. If each member of this set is multiplied by 2, what is the range of the new set of data?

   A. 15
   B. 30
   C. 45
   D. 225

   15
   $\times 2$
   $\overline{30}$

4. Julie has a data set for which the mean is 41. Each value of the data set is multiplied by 7. What is the mean for the new data set?

   A. 287
   B. 144
   C. 41
   D. 7

   41
   $\times 7$
   $\overline{287}$

Identify the effect on mean, median, mode, and range when values in the data set are changed.

5. Manuel observes that students in his classroom purchase drinks in the cafeteria as follows:

   7 chocolate milks, 8 sport drinks, 5 waters, 4 white milks, and 6 juices

   4, 4, 5, 7, 8

   Two students are added to the class, and they both choose juice. How does that affect the median?

   4, 5, 6, 7, 8

   A. It will not affect the median.
   B. There is not a median
   C. The number of juice drinks will double.
   D. The median will be 6.

6. Mike runs an average of 2 miles per day. He is going to begin training for cross-country and wants to double the amount he runs per day. How will this affect the average amount he runs?

   A. There will be no change in his average.
   B. His distance will increase by 2 miles per day.
   C. His average will double.
   D. His average distance will increase by 3 miles.

7. This set of data shows the scores that Tyler earned on his last 7 Algebra I tests. If the two lowest scores are dropped, which statement is true?

   {97, 88, 93, 100, 85, 90, 80}

   80 85 88 90 93 97 100

   mean 90.4
   man 90
   rng 20

   A. The mean will increase by 5 pts.
   B. The median will increase by 3 pts.
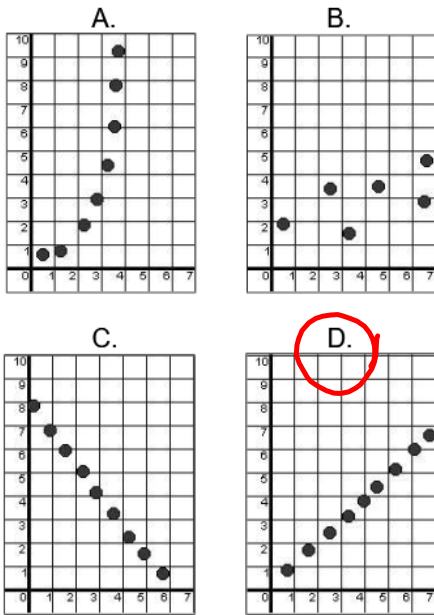   C. The range will decrease by 8 pts.
   D. The mean will increase by 7 pts.

   88 90 93 97 100
   mean = 93.6
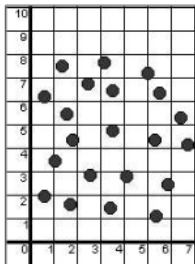   mdn = 93
   rng = 12

Algebra I EOC
Practice #27

1. Which scatterplot best represents a positive linear relationship between the variables x and y?

A.

B.

C.

D.

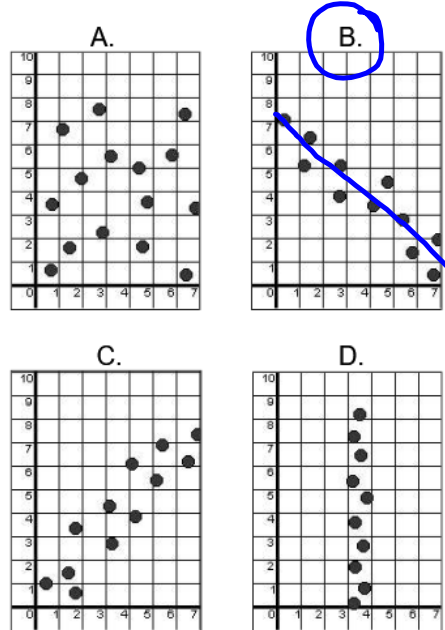3. Which graph best shows a negative linear relationship between variables x and y?

A.

B.

C.

D.

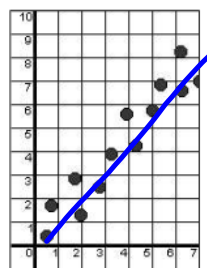2. What type of correlation is shown in the scatterplot below?

A. Positive correlation
B. Negative correlation
C. No correlation
D. Random correlation

4. What type of correlation is shown in the scatterplot below?

A. Positive correlation
B. Negative correlation
C. No correlation
D. Random correlation

Determine the factored form of the following quadratic function. $y = x^2 + 11x + 18$

$+11$ $\times$ $+18$

a) $y = (x + 1)(x + 18)$
b) $y = (x + 3)(x + 6) = x^2 + 6x + 3x + 18$
c) $y = (x + 2)(x + 9) = x^2 + 2x + 9x + 18$
d) $y = (x + 1)(x + 11)$

Tell whether the graph of the quadratic function $y = -3x^2 + x + 1$ opens upwards or downward. ↑

a) Because $a < 0$, the parabola opens downward.
b) Because $a > 0$, the parabola opens downward.
c) Because $a < 0$, the parabola opens upward.
d) Because $a > 0$, the parabola opens upward.

Liam catapults a rock at 96 ft/s from a height of 15 feet. The height of the rock is modeled by the equation: $h(t) = -16t^2 + 96t + 15$. At what time does the rock reach its maximum height?

a) 1 second
b) 2 seconds
c) 3 seconds
d) 4 seconds

$$x = \frac{-b}{2a}$$

Which description most accurately describes the correlation?

a) negative strong
b) positive perfect
c) positive strong
d) no correlation
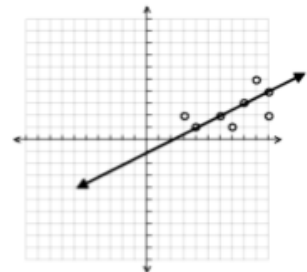
May 23, 2019, Thursday

Write two good <u>short answer questions</u> for a final exam

& include the answer.

May 24, 2019, Friday

Write two good <u>multiple choice questions</u> for a final exam
& include the answer.