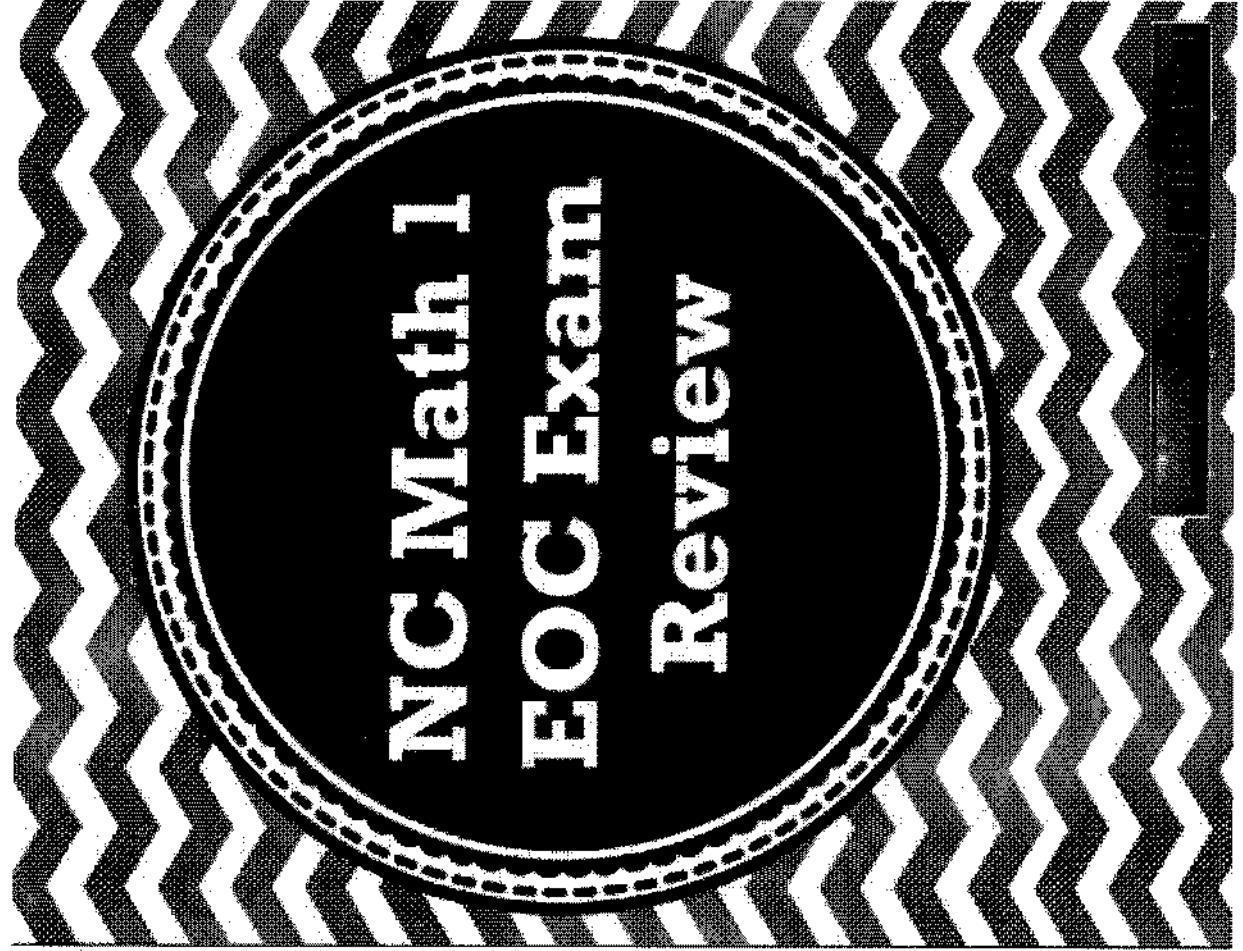


Homework

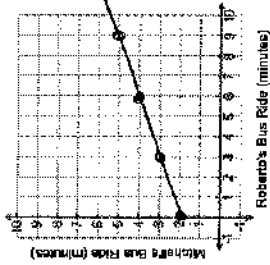


Names: Key Date: _____
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NC Math 1 EOC Review

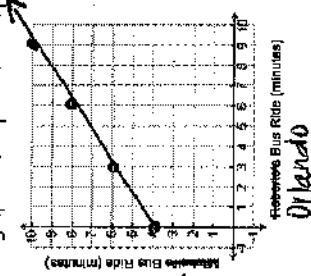
Answer all questions to the best of your ability.

1. Mitchell's bus ride to school is 2 minutes more than $\frac{2}{3}$ the time of Roberto's bus ride. Draw a graph that represents the possible times of Mitchell and Roberto's bus rides.



$$M = 2 + \frac{1}{3}R$$

2. Orlando's bus ride to school is 4 minutes more than $\frac{2}{3}$ the time of Jack's bus ride. Draw a graph that represents the possible times of Orlando and Jack's bus rides.



$$O = 4 + \frac{2}{3}J$$

3. Graph an inequality that represents the following statements.

a. The number of pounds of apples, y , plus half the number of pounds of oranges, x , is at most 5.

$y + \frac{1}{2}x \leq 5$
 $y \leq -\frac{1}{2}x + 5$

b. The number of pounds of apples, y , plus two times the number of pounds of oranges, x , is at most 5.

$y + 2x \leq 5$
 $y \leq -2x + 5$

4. Factor $x^2 - 49$.

$(x+7)(x-7)$

5. Factor $4x^2 - 169$.

$(2x+13)(2x-13)$

6. Graph the following.

a. $f(x) = -2x^2 + 8x - 3$ - y-intercept

$NO \pm \frac{-b}{2a} = \frac{-8}{2(-2)} = \frac{-8}{-4} = 2$

$V = -2(2)^2 + 8(2) - 3$
 $-8 + 16 - 3$
 5
 $V = (2, 5)$

b. $f(x) = 2x^2 + 8x + 1$ - y-intercept

$NO \pm \frac{-b}{2a} = \frac{-8}{2(2)} = \frac{-8}{4} = -2$

$V = 2(-2)^2 + 8(-2) + 1$
 $8 - 16 + 1$
 -7
 $V = (-2, -7)$

7. A rectangular swimming pool is twice as long as it is wide. A small concrete walkway surrounds the pool. The walkway adds 2 feet to each dimension. Find the area of the pool.

$(2x+4)(x+4)$
 $2x^2 + 8x + 4x + 16$
 $2x^2 + 12x + 16 + \text{pool w/walkway}$

8. The museum where Julia works plans to have a large wall mural replica of Vincent van Gogh's *The Starry Night* painted in its lobby. First, Julia wants to paint a large frame around where the mural will be. The mural's length will be 4 feet longer than its width, and the frame will be 3 feet wide on all sides.

a. What is the area of the mural with the frame?

$W \times 10$

$w+6$

$(w+6)(w+10) = 140$
 $w^2 + 16w + 6w + 60 = 140$
 $w^2 + 22w - 80 = 0$
 $(w+20)(w-4) = 0$
 $w = 4$

b. If the total area is 140 square feet, what are the dimensions of the mural?

$w = 4$
 $l = 8$

9. Two boys, Shawn and Curtis, went for a walk. Shawn began walking 10 seconds earlier than Curtis.

- Shawn walked at a speed of 3 feet per second.
- Curtis walked at a speed of 4 feet per second.

After how many seconds has Shawn been walking at the moment when the two boys had walked exactly the same distance.

	t	d
S	x	$3x$
C	$x-10$	$4(x-10)$

$3x = 4x - 40$
 $-4x$
 $-1x = -40$
 $x = 40$

$3(x+10) = 4x$
 $3x + 30 = 4x$
 $x = 30$

10. A school holds a dance concert for the community.

- 5 children and 2 adults brought in \$106
- 3 children and 2 adults bring in \$90

How much does each child cost to get in?

$$\begin{array}{r} 5c + 2a = 106 \\ -3c + 2a = 90 \\ \hline 8c = 16 \\ c = 2 \end{array}$$

\$8.00

11. Tanisha is working on her geometry homework. The problem is below.

- Two angles equal up to 75°
- Angle A is 135° smaller than four times angle B.

What are the measures of the angles?

$$\begin{array}{r} A + B = 75 \\ A = 4B - 135 \\ \hline 4B - 135 + B = 75 \\ 5B = 210 \\ B = 42^\circ \\ A = 33^\circ \end{array}$$

12. The product of two positive consecutive integers is 90. Find the integers.

$$\begin{array}{l} 1st \# \ x \\ 2nd \# \ x+1 \\ x(x+1) = 90 \\ x^2 + x - 90 = 0 \\ (x - 9)(x + 10) \\ x = 9 \quad x = -10 \end{array}$$

#s
9 & 10

13. Find three positive consecutive integers such that the product of the first and second is 2 more than 9 times the third.

$$\begin{array}{l} 1st \# \ x \\ 2nd \# \ x+1 \\ 3rd \# \ x+2 \\ x(x+1) = 2 + 9(x+2) \\ x^2 + x = 2 + 9x + 18 \\ -9x \\ x^2 - 8x - 20 = 0 \\ (x - 10)(x + 2) = 0 \\ x = 10 \quad x = -2 \end{array}$$

#s
10, 11, 12

14. Find two consecutive positive integers such that the square of the first decreased by 25 equals three times the second.

$$\begin{array}{l} 1st \# \ x \\ 2nd \# \ x+1 \\ (x)^2 - 25 = 3(x+1) \\ x^2 - 25 = 3x + 3 \\ x^2 - 3x - 28 = 0 \\ (x - 7)(x + 4) \quad x = 7 \quad x = -4 \end{array}$$

#s 7 & 8

15. If a toy rocket is launched vertically upward from ground level with an initial velocity of 128 feet per second, then its height, h , after t seconds is given by the equation $h(t) = -16t^2 + 128t$. How long will it take for the object to hit the ground?

$$\begin{array}{l} -16t(t - 8) \\ t = 0 \quad t = 8 \end{array}$$

8 seconds

16. Jason was cliff jumping in Acapulco while vacationing with some friends. His height as a function of time could be modeled by the function $h(t) = -16t^2 + 32t + 480$, where t is the time in seconds and h is the height in feet. How long did it take for Jason to reach his maximum height?

$$\begin{array}{l} -\frac{b}{2a} = \frac{-32}{2(-16)} = \frac{-32}{-32} = 1 \\ -16(1)^2 + 32(1) + 480 \\ -16 + 32 + 480 \\ 496 \end{array}$$

1 second

24. Jace and Phillip are playing a game.

- Jace and Phillip each start with 50 points.
- At the end of each turn Jace's points triple.
- At the end of each turn Phillip's points increase by 150.

At the start of which turn will Phillip first have more points than Jace?

Turn	Jace	Phillip
0	50	50
1	150	200
2	450	350
3	1350	500

Start of the 2nd turn

25. Lee walked 2 miles in 46 minutes. Adam walked 5,280 yards in an hour. How much faster, in miles per hour, did Adam walk than Lee? (Hint: 1760 yds = 1 mile)

Lee - $\frac{2 \text{ mil}}{46 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = \frac{2.4 \text{ mil}}{46 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 3 \text{ mil/hr}$

Adam - $\frac{5280 \text{ yds}}{1 \text{ hr}} \cdot \frac{1 \text{ mil}}{1760 \text{ yds}} = 3 \text{ mil/hr}$

26. Jessica ran 1 mile in 8 minutes. Janice ran 3520 yards in 18 minutes. How much slower, in miles per hour, did Janice walk? (Hint: 1760 yds = 1 mile)

Jessica - $\frac{1 \text{ mil}}{8 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 7.5 \text{ mil/hr}$

Janice - $\frac{3520 \text{ yds}}{18 \text{ min}} \cdot \frac{1 \text{ mil}}{1760 \text{ yds}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 6.7 \text{ mil/hr}$

8.3 slower

27. Write an equivalent expression for the following radicals.

a. $\sqrt[3]{9x^2y^2z^3}$

b. $\sqrt[3]{27x^4y^5z^6}$

OR

($9x^4y^5z^6$)^{1/3}

($27x^4y^5z^6$)^{1/3}

OR

($9x^4y^5z^6$)^{1/3}

($27x^4y^5z^6$)^{1/3}

28. A school purchases cases of doughnuts.

- Each case contains 12 boxes of doughnuts.
- Each case costs \$72.

How much does each school have to charge for each box of doughnuts in order for them to make a profit of \$24.

$12x - 72 = 24$
 $+72$
 $12x = 96$
 $x = 8$

\$8/box

29. A school purchases boxes of candy.

- Each box contains 60 candy bars
- Each box costs \$45.

How much money does each school have to charge for each candy bar to make a profit of \$15 per box?

$60x - 45 = 15$
 $+45$
 $60x = 60$
 $x = 1$

\$1/bar

30. Perimeter of a rectangle are related by the formula $P = 2L + 2W$.

- L is the length of the rectangle
- W is the width of the rectangle

What is the equation that finds L, given P and W?

$P = 2L + 2W$
 $P - 2W = 2L$
 $\frac{P - 2W}{2} = L$

$L = \frac{P - 2W}{2}$

31. Area of a triangle is related by $A = \frac{1}{2}bh$.

- B is the base of the triangle
- H is the height of the triangle

What is the equation that finds b, given h and A?

$$2 \cdot A = \left(\frac{1}{2}bh \right) \cdot 2$$

$$\frac{2A}{h} = \frac{bh}{h}$$

$$b = \frac{2A}{h}$$

32. A model rocket is launched from the roof of a building. Its flight path is modeled by $h = -5t^2 + 40t + 100$ where h is the height of the rocket above the ground in meters and t is the time after the launch in seconds. At what time did the rocket reach its maximum height?

$$-\frac{b}{2a} = \frac{-40}{2(-5)} = \frac{-40}{-10} = 4 \text{ seconds}$$

33. Suppose the equation $V = 40x^2 - 390x + 1500$ represents the value of a car from 1964 to 2015. What year did the car have the least value? (x=0 in 1964)

When $x=5$

0	1500	1964
1	1150	+ 4.8
2	880	1968
3	690	
4	580	
5	550	
6	600	
7	730	

$$-\frac{b}{2a} = \frac{-390}{2(40)} = \frac{-390}{80} = -4.875$$

34. What is an equivalent expression to $(x^{\frac{1}{3}})^{-6}$ $x^{-4} = \frac{1}{x^4}$

35. What is an equivalent expression to $(x^{\frac{2}{3}})^{\frac{3}{4}}$ $x^{\frac{8}{4}} = x^2$

36. The table below shows the average weight of domestic cats after several weeks.

Week	1	2	3	4	5	6	7
Weight (kg)	2.01	2.03	2.05	2.06	2.06	2.07	2.15

What is the average rate of change in weight of the cats from week 1 to week 7?

$$\frac{-0.01 + 0.06 + 0.06 + 0.06 + 0.07 + 0.15}{6} = 0.083$$

37. The table below shows the average weight of domestic cats after several weeks.

Week	1	2	3	4	5	6	7
Weight (kg)	2.01	2.03	2.05	2.06	2.06	2.07	2.15

What is the average rate of change in weight of the cats from week 4 to week 7?

$$\frac{0.06 + 0.07 + 0.15}{3} = 0.053$$

38. Alex compared the y-intercept of the graph of the function $f(x) = 2x + 1$ to the y-intercept of the graph of the linear function $g(x)$ that includes the points in the table below.

x	y
0	3
1	2
2	1
3	0
4	-1

What is the difference when the y-intercept of $f(x)$ is subtracted from the y-intercept of $g(x)$?

$$3 - 1 = 2$$

$$g(x) - f(x)$$

39. Sara compared the y-intercept of the graph of the function $f(x) = 3x + 4$ to the y-intercept of the graph of the linear function $g(x)$ that includes the points in the table below. What is the difference when the y-intercept of $g(x)$ is subtracted from $f(x)$?

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

$$4 - 2 = 2$$

$$f(x) - g(x)$$

40. Cell Phone Company Y charges a \$15 start up fee plus \$0.20 per minute, x. Cell Phone Company Z charges \$0.15 per minute, x, with no start up fee. Write a function that represents the difference in cost between Company Y and Company Z.

$$Y: 15 + .20x$$

$$Z: .15x$$

$$Y - Z$$

$$(15 + .20x) - (.15x)$$

$$15 + .05x$$

41. The cost of school A's banquet is \$95 plus \$15 for each person attending. The cost for school B's banquet is \$75 plus \$25 for each person attending. Write a function that represents the difference between School A and School B.

$$A: 95 + 15x$$

$$B: 75 + 25x$$

$$A - B$$

$$(95 + 15x) - (75 + 25x)$$

$$20 - 10x$$

42. Determine whether each table is linear, exponential, neither, or quadratic.

a.

x	-3	-2	-1	0	1	2	3
y	21	12	5	0	-3	-4	-3

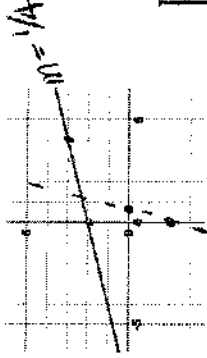
quadratic

b.

x	-3	-2	-1	0	1	2	3
y	4	8	16	32	64	128	256

exponential

43. Taylor compared the slope of the function graphed below to the slope of the linear function that has an x-intercept of $\frac{2}{3}$ and a y-intercept of -3. What is the slope of the function with the smaller slope?



$$\left(\frac{2}{3}, 0\right)(0, -3)$$

$$\frac{0 - (-3)}{\frac{2}{3} - 0} = \frac{3}{\frac{2}{3}} = \frac{9}{2} = 4.5$$

smaller
 $m = \frac{1}{4}$

44. The boiling point of water, T (measured in degrees), at altitude a (measured in feet) is modeled by the function $T(a) = -0.014a + 214$. In terms of altitude and temperature what does the 214 mean?

at an altitude of 0 ft the temp. of the water is 214 degrees.

45. A line segment has endpoints $P(-1, 5)$ and $R(2, -4)$. The point Q is the midpoint of $\overline{PR}$. What is an equation of a line perpendicular to $\overline{PR}$ and passing through Q ?

$$P(-1, 5) \quad Q(.5, .5) \quad R(2, -4)$$

$$m_{\overline{PR}} = \frac{5 - (-4)}{-1 - 2} = \frac{9}{-3} = -3 \quad \perp m = \frac{1}{3}$$

$$y = mx + b$$

$$.5 = \frac{1}{3}(.5) + b$$

$$b = \frac{1}{3}$$

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

46. A line segment has endpoints $P(7, 0)$ and $R(-1, 4)$. The point Q is the midpoint of $\overline{PR}$. What is an equation of a line perpendicular to $\overline{PR}$ and passing through Q ?

$$P(7, 0) \quad Q(3, 2) \quad R(-1, 4)$$

$$m_{\overline{PR}} = \frac{0 - 4}{7 - (-1)} = \frac{-4}{8} = -\frac{1}{2} \quad \perp m = 2$$

$$y = mx + b$$

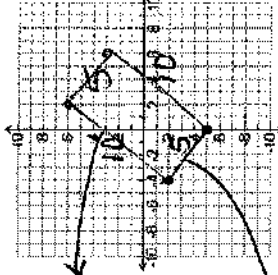
$$2 = 2(3) + b$$

$$b = -4$$

$$y = 2x - 4$$

$$\sqrt{(x-x)^2 + (y-y)^2}$$

47. A figure has vertices $A(0, -5)$, $B(-4, -2)$, $C(2, 6)$, and $D(6, 3)$. What is the approximate perimeter of the figure?



$$d = (-4, -2)(2, 6)$$

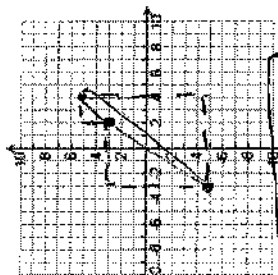
$$\sqrt{(-4-2)^2 + (-2-6)^2} = 10$$

$$d = (-4, -2)(0, -5)$$

$$\sqrt{(-4-0)^2 + (-2+5)^2} = 5$$

$$\sqrt{(-4-0)^2 + (-2+5)^2} = 5 \quad P = 30$$

48. A triangle has vertices $A(2, 3)$, $B(4, 5)$, and $C(-3, -5)$. What is the approximate perimeter of the triangle?



$$d = (2, 3)(4, 5)$$

$$\sqrt{(2-4)^2 + (3-5)^2} = 2.83$$

$$d = (2, 3)(-3, -5)$$

$$\sqrt{(2+3)^2 + (3+5)^2} = 9.43$$

$$d = (4, 5)(-3, -5)$$

$$\sqrt{(4+3)^2 + (5+5)^2} = 12.21$$

$$P = 24.47$$

49. During the JV basketball season the following data is a list of the points scored during each of the first 10 games.

If the team scores 8, 4, 6, 7, 7, 9, 4, 8, 5. If the team scores 8, 9, 10, and 6 on the next 4 games what measure of center/spread will decrease? (Hint: mean? Range? IQR? Standard deviation?)

original

$$\bar{x} = 6.4$$

$$s_x = 1.7$$

$$R = 5$$

$$IQR = 3$$

new

$$\bar{x} = 6.9$$

$$s_x = 1.9$$

$$R = 6$$

$$IQR = 2$$

IQR will decrease

50. Sara rolled a dice. The following data is the # that was at the top of the dice during each roll: 6, 3, 5, 4, 2, 3, 2. If the next 4 rolls of the dice produced 1, 3, 2, 6 which measure of center/spread will decrease? (hint: mean? Range? IQR? Standard deviation?)

Original $\bar{x} = 3.57$ range = 4
 New $\bar{x} = 3.36$ range = 5
 $8x = 1.5$ IQR = 3
 $8x = 1.68$ IQR = 3

51. A college surveyed 3,500 of its students to determine if the students preferred music, movies, or sports. The results of the survey are shown in the relative frequency table below.

	Music	Movies	Sports
Freshman	0.06	0.10	0.09
Sophomores	0.09	0.05	0.10
Juniors	0.10	0.06	0.08
Seniors	0.08	0.09	0.10

$= .25 \times 3,500 = 875$
 $= .24 \times 3,500 = 840$

How many more Freshman participated in the survey compared to Sophomores?

35

52. A classroom with 26 8th grade students was surveyed about the type of birthday they preferred. Below is the relative frequency table that is created from this data.

	Male	Female	Total
Bowling	0.23	0.07	0.30
Skating	0.12	0.43	0.55
Dancing	0.03	0.12	0.15
Total	0.38	0.62	1.00

Which of the following statements is NOT true?

- A. 4 more males than females prefer bowling ✓
 B. 11 students are female and prefer skating ✓
 C. There are 10 total students who prefer dancing ✓
 D. There are 16 total female students ✓

53. What is the slope of the table below? What does it mean in words?

Number of times played	0	1	2	3
Total Cost	150	165	180	195

\$15 per play

$m = \frac{y-y}{x-x} = \frac{150-165}{0-1} = 15$
 $\frac{y}{x}$ total cost
 x # played

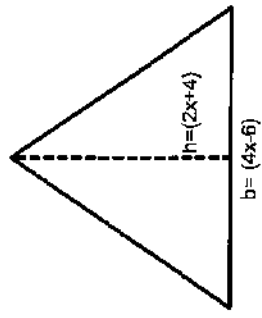
54. What is the slope of the table below? What does it mean in words?

Day	0	1	2	3
Sunflowers Height in Centimeters	12	12.6	13.2	13.8

the sunflowers grow 3 centimeters per day

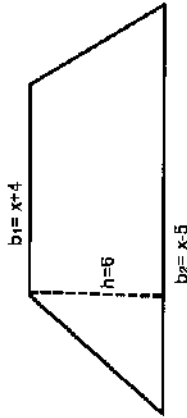
$\frac{12-12.6}{0-1} = \frac{3}{5}$ height
 $\frac{y}{x}$ height

55. The area of a triangle is found using the formula $A = \frac{1}{2} b * h$, where A is the area, h is the height, and b is the base. Find the area of the triangle below.



$\frac{1}{2} (4x-6)(2x+4)$
 $(2x-3)(2x+4)$
 $4x^2 + 2x - 12$

56. The area of a trapezoid is found using the formula $A = \frac{1}{2}h(b_1 + b_2)$, where A is the area, h is the height, and b_1 and b_2 are the lengths of the bases.



$$\frac{1}{2}(6)(x+4 + x-5)$$

$$3(2x-1)$$

$$\boxed{6x-3}$$

57. A company produces packs of pencils and pens.

- The company produces at least 30 packs of pens each day but no more than 40.
- The company produces at least 80 packs of pencils each day but no more than 110.
- A total of less than 130 packs of pens and pencils are produced each day.
- Each pack of pens makes a profit of 2.20.
- Each pack of pencils makes a profit of 1.25.

What is the maximum profit the company can make each day?

$$40(2.20) + 80(1.25) = \boxed{199.25}$$

maximize pens b/c they cost more

58. Whatzup Toyz is a small toy company that specializes in toy cars and toy trucks.

The people at Whatzup Toyz are confident they can sell all the toy cars and trucks they make. But there are two constraints that limit their production today:

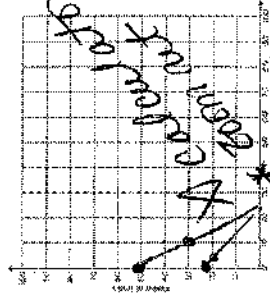
WHEELS: Each car needs 4 wheels. Each truck needs 6 wheels. $4c + 6t \leq 140$

Whatzup Toyz has 140 wheels in stock.

SEATS: Each car needs 2 seats. Each truck needs 1 seat.

Whatzup Toyz has 50 seats in stock. $2c + 1t \leq 50$

Suppose the profit on each toy car is \$1 and each truck is \$3. How many cars and how many trucks should Whatzup Toyz make in order to maximize their profit?



$$4c + 6t \leq 140$$

$$\frac{140 - 4c}{6} \leq t$$

$$t \leq -\frac{2}{3}c + \frac{70}{3}$$

$$t \leq -20 + 50$$

Intersection (20, 10)

59. How many pounds of coffee worth \$1.00 per pound must be mixed with 15 pounds of coffee worth \$1.60 per pound to obtain a blend worth \$1.20 per pound?

$$x + 15 = 1.20$$

$$1x + 1.60(15) = 1.20(x + 15)$$

$$x + 24 = 1.20x + 18 \rightarrow -0.20x = -6$$

$$\boxed{x = 30}$$

60. Lucy and Barbara began saving money the same week. The table below shows the models for the amount of money Lucy and Barbara have saved after x weeks.

Lucy's Savings	$F(x) = 3x - 5$
Barbara's Savings	$G(x) = 2x + 3$

After how many weeks will Lucy and Barbara have the same amount of money saved?

$$3x - 5 = 2x + 3$$

$$\boxed{x = 8}$$

61. Terry and Jim began losing weight the same week. The table below shows the models for the amount of weight that Terry and Jim have lost.

Terry's Weight Loss	$F(x) = 150 - 2x$
Jim's Weight Loss	$G(x) = 220 - 4x$

After how many weeks will Terry and Jim have matching weights?

$$150 - 2x = 220 - 4x$$

$$2x = 70$$

$$x = 35$$

62. Jean noticed that various combinations of nickels and dimes could add up to \$0.85.

- Let x equal the number of nickels
- Let y equal the number of dimes

$$.05n + .10d = .85$$

What is the domain where the total value is \$0.85?

nickels

nickels $\{1, 3, 5, 7, 9, 11, 13, 15, 17\}$

63. The value of an antique car is modeled by the function $V = 250000(1.007)^{\frac{x}{2}}$ where x is the number of years since 2003. By what approximate percent rate is the value of the car increasing per year?

$$\frac{1.007 - 1}{1} = .007$$

$$.7\% \times \frac{1}{4}$$

$$.175\%$$

64. The value of a brand new car is modeled by the function $V = 15000(0.997)^{\frac{x}{2}}$ where x is the number of years since 2010. By what approximate percent rate is the value of the car decreasing per year?

$$90.3 \times \frac{1}{2}$$

$$.097$$

$$36.12\%$$

65. The table below shows the cost of a pizza based on the number of toppings. Write a function that would represent the cost of a pizza with n toppings.

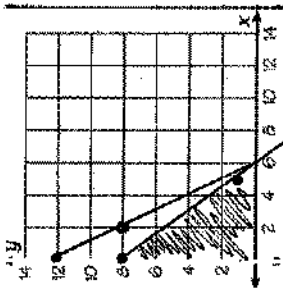
Number of Toppings (n)	Cost (C)
1	9.20
2	10.40
3	11.60
4	12.80

$$y = 1.2x + 8$$

66. Paul sells chocolate chip cookies and peanut butter cookies.

- Baking a batch of chocolate chip cookies takes 1.75 cups of flour and 2 eggs.
- Baking a batch of peanut butter cookies takes 1.25 cups of flour and 1 egg.
- Paul has 10 cups of flour and 12 eggs.
- He makes \$4 profit per batch of chocolate chip cookies.
- He makes \$2 profit per batch of peanut butter cookies.

How many batches of chocolate chip cookies should he make to maximize his profit?



$$\begin{array}{r|l} \text{CC} & \text{pb} \\ \hline F & 1.75x \quad 1.25y \quad | \quad 10 \\ \hline E & 2x \quad 1y \quad | \quad 12 \\ \hline T & 4x \quad 2y \quad | \end{array}$$

$$1.75x + 1.25y = 10$$

$$y = \frac{10 - 1.75x}{1.25} \leq \frac{8 - 1.4x}{1}$$

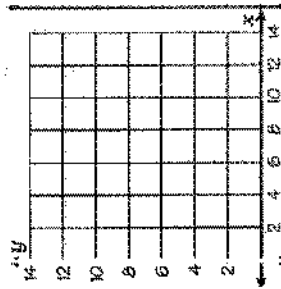
Intersection
(6.7, -1.3)

Answer key (5,1) $2x + 1y = 12$
 $12 - 2x$
 $y \leq 12 - 2x$

67. Paul sells chocolate chip cookies and peanut butter cookies.

- Baking a batch of chocolate chip cookies takes 1.75 cups of flour and 2 eggs.
- Baking a batch of peanut butter cookies takes 1.25 cups of flour and 1 egg.
- Paul has 15 cups of flour and 16 eggs
- He makes \$5 profit per batch of chocolate chip cookies.
- He makes \$3 profit per batch of peanut butter cookies.

What would his maximum profit be?



	cc	pb
f	1.75x	1.25y
e	2x	1y
T	5	3

$$1.75x + 1.25y = 15$$

$$2x + y = 16$$

$$y = 15 - 1.75x = 12 - 1.4x$$

$$y = -2x + 16$$

68. The sequence below shows the number of flowers that a florist plants each year to keep up with demand.

15, 45, 135, 405, ...

x 3 geometric/exp.

Write a Recursive formula that could be used to determine the number of flowers the florist will plant next year, NEXT, if the number of flowers planted this year, NOW, is known.

$$NEXT = NOW \cdot 3, G(1) = 15$$

$$G_n = G_{n-1} \cdot 3, G(1) = 15$$

69. Write a recursive formula for the sequence: 33, 42, 51, 60, 69, 78, ...

+ 9 arithmetic/linear

$$A(n) = A(n-1) + 9, A(1) = 33$$

#68. Explicit

$$G(n) = 15 \cdot 3^{n-1}$$

$$15 \quad 45 \quad 135$$

$$2 \quad 45 \quad 135$$

$$3 \quad 135$$

$$y = 5 \cdot 3^n$$

#69. Explicit

$$A(n) = 33 + 9(n-1)$$

$$33 \quad 42 \quad 51 \quad 60 \quad 69 \quad 78$$

$$2 \quad 42 \quad 51 \quad 60 \quad 69 \quad 78$$

$$3 \quad 51 \quad 60 \quad 69 \quad 78$$

$$y = 9n + 24$$

70. You want to rent a rowboat for a fishing trip. There is an initial fee of \$8, plus a \$12 daily fee. Write a linear equation for this situation where y represents the cost of renting a rowboat and x represents the number of days rented.

$$y = 8 + 12x$$

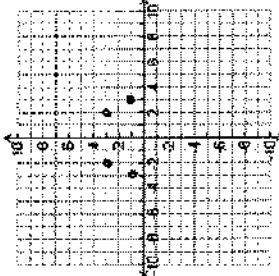
$$y = 12x + 8$$

71. The cost of renting a car is \$26 plus 15¢ per mile. Write a linear equation that relates the total cost of renting a car, y, with the number of miles driven, x.

$$TC = 26 + .15m$$

$$y = .15x + 26$$

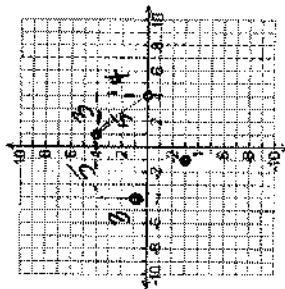
72. The vertices of quadrilateral ABCD are A(-2,3), B(2,3), C(3,1), and D(-3,1). What kind of quadrilateral is ABCD?



Trapezoid

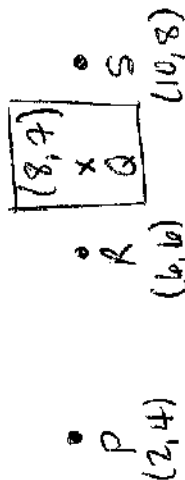
$$A = \frac{1}{2}h(b_1 + b_2)$$

73. The vertices of quadrilateral EFGH are E(1,4), F(4,0), G(-1,-3), H(-4,1). What kind of quadrilateral is EFGH?

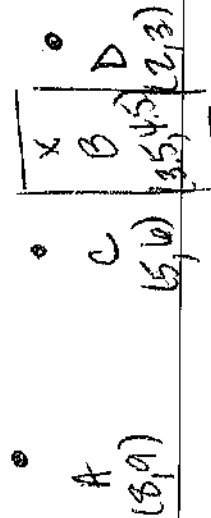


Rectangle

74. R is the midpoint of segment PS. Q is the midpoint of segment RS. P is located at (2,4) and S is located at (10,8). What are the coordinates of Q?



75. C is the midpoint of segment AD. B is the midpoint of segment CD. A is located at (8,9) and D is located at (2,3). What is the coordinate for B?



76. The sequence below shows the total number of days Francisco had used his gym membership at the end of weeks 1,2,3, and 4.

16, 21, 26, 31

Assuming the pattern continued, write a function that could be used to find the total number of days Francisco had used his gym membership at the end of the week n .

$$y = x + 5$$

77. The sequence below shows the total number of days Francisco had used his gym membership at the end of weeks 1,2,3, and 4.

9, 14, 19, 24

Assuming the pattern continued, write a function that could be used to find the total number of days Francisco had used his gym membership at the end of the week n .

$$y = 5x + 4$$

78. The volume of a sphere is 1150 cubic centimeters. What is the approximate diameter of this sphere? (Volume of a sphere $V = \frac{4}{3}\pi r^3$.)

$$1150 = \frac{4}{3}\pi r^3$$

$$r^3 = 274.5$$

$$r = 6.5$$

$$d = 13$$

79. The volume of a sphere is 2145 cubic centimeters. What is the approximate diameter of this sphere? (Volume of a sphere $V = \frac{4}{3}\pi r^3$)

$$2145 = \frac{4}{3}\pi r^3$$

$$r^3 = 512$$

$$r = 8$$

$$d = 16$$

80. The number of points scored by a basketball player in the first eight games of a season are shown: 23, 15, 31, 24, 14, 18, 21, 29. What would happen to the data distribution if she scored 12, 15, 19, 32 in the next 4 games?

original

$$\bar{x} = 21.875$$

$$med = 22$$

$$sx = 6.2$$

$$range = 17$$

$$IQR = 10$$

new

$$\bar{x} = 21.1$$

$$med = 20$$

$$sx = 6.8 \rightarrow \text{more spread}$$

$$range = 20 \text{ (less peaked)}$$

$$IQR = 11.5$$

81. The number of points scored by a basketball player in the first eight games of a season are shown: 24, 32, 18, 17, 21, 19, 15, 12. What would happen to the data distribution if she scored 19, 18, 26, 24 in the next four games.

original

$$\bar{x} = 19.75$$

$$sx = 5.73$$

new

$$\bar{x} = 20.42$$

$$sx = 5.15 \rightarrow \text{less spread}$$

(more peaked)

82. The chart below shows the annual cost of raising a child (y) compared to the child's age (x). What percentage of the data is more than \$290 different from the cost predicted by the line of best fit for the data?

Age (x)	Cost (y)
3	10,700
6	11,700
9	12,800
12	15,000
15	18,700

$$y = 510x + 8750$$

observed value

predicted value

$$3/5$$

$$60\%$$

420 110 740 130 200

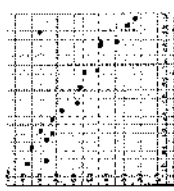
83. The table below shows the relationship between the number of study hours (X) and the grade made on the test (y) for a set of students. What percentage of the data is more than 2 points different from the cost predicted by the line of best fit for the data?

Study Hours	Grade
3	84
2	77
5	92
1	70
0	60
4	90
3	75

observed - predicted

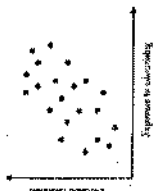
$$5/7 = 71\%$$

84. Describe the relationship between the values in the graph below. (What type of correlation)

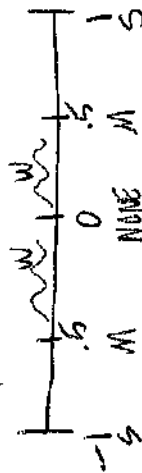


strong negative

85. Describe the relationship between the values in the graph below. (What type of correlation)



Weak positive correlation



86. How do I know when to use the mean, median, mode or IQR to understand situations. For example, think back to the elevator problem when Bill wanted to use one of the measures to determine how many people could be on the elevator. In order to accomplish this you must know what they mean. Define them below:

Mean: Average $\bar{x}$ - add & divide by how many #'s -

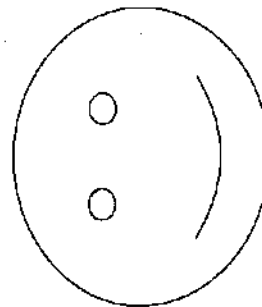
Median: Middle # - have to be in order - use when there is an outlier

Mode: # used most - use when categorical data

Range: biggest # - smallest MAX-MIN

IQR: $Q_3 - Q_1$

Standard Deviation: s_x - spread



GOOD LUCK
ON THE
EXAM!!

