Q2 Review - Honors

1. Write an explicit rule and a recursive rule for each sequence.

n	1	2	3	4	5
***f*(*n*)**	8	12	16	20	24

n	1	2	3	4	5
***f*(*n*)**	11	7	3	- 1	-5

2. The explicit rule for an arithmetic sequence is $f(n) = 13 + 6(n - 1)$. Find the first four terms of the sequence.

3. The explicit rule for an arithmetic sequence is $f(n) = 18 + 5(n - 1)$. Write a recursive rule for this sequence.

4. A recursive rule for an arithmetic sequence is $f(1) = 7$, $f(n) = f(n - 1) + 47$ for $n \geq 2$. Write an explicit rule for this sequence.

5. $f(n) = 900 - 60(n - 1)$ represents the amount Oscar still needs to repay on a loan at the beginning of Month n. Find the amount Oscar pays monthly and the month in which he will make his last payment.

6. Use the functions $\boldsymbol{f(x) = x - 13}$, $\boldsymbol{g(x) = -6x + 15}$, $\boldsymbol{k(x) = -2/3}$, and $\boldsymbol{m(x) = -4x - 17}$ to find each new function:

a) $h(x) = g(x) - f(x)$ b) $h(x) = f(x) - (g(x) + m(x))$ c) $h(x) = k(x) \times (f(x) + m(x))$

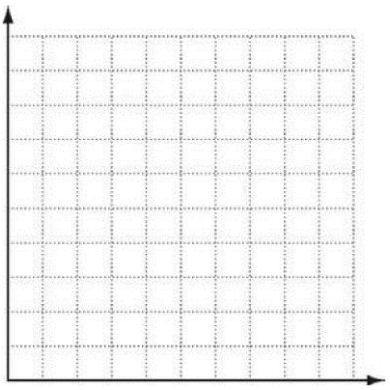
7. Find the inverses of the following functions:

a) $f(x) = 6x - 1$ b) $f(x) = \frac{x+7}{8}$. c) $f(x) = \frac{1}{8}x - 1$

8. Use substitution to tell whether each ordered pair is a solution of the given inequality.

a) $(3, 4); y > x + 2$ b) $(4, 2); y \leq 2x - 3$ c). $(2, -1); y < -x$

9. Trey is buying peach and blueberry yogurt cups. He will buy at most 8 cups of yogurt. Let *x* be the number of peach yogurt cups and *y* be the number of blueberry yogurt cups he buys.



a. Write an inequality to describe the situation.

_____

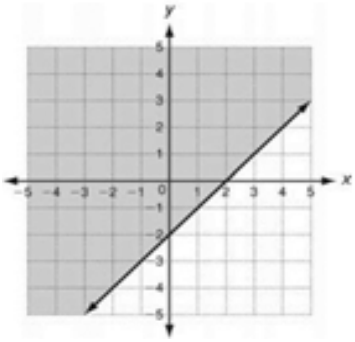
b. Graph the solutions.

c. Give two possible combinations of peach and blueberry yogurt that Trey can choose.

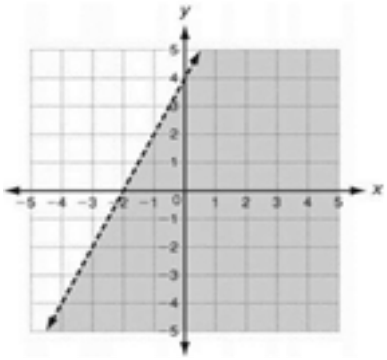
_____

10. Write an inequality to represent each graph.

a)



b)

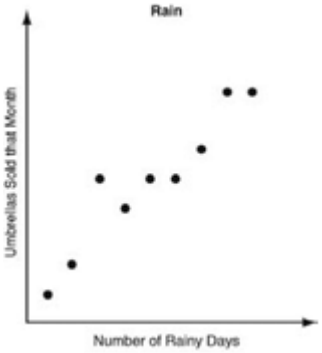


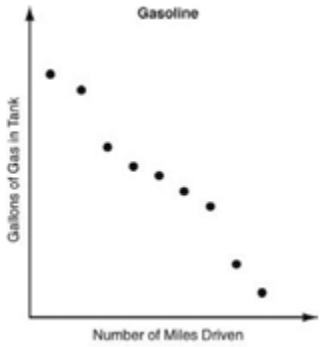
11. **Write an inequality for each situation.**

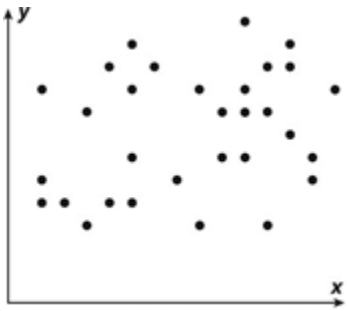
a) Hats (*x*) cost $5 and scarves (*y*) cost $8. Joel can spend at most $40.

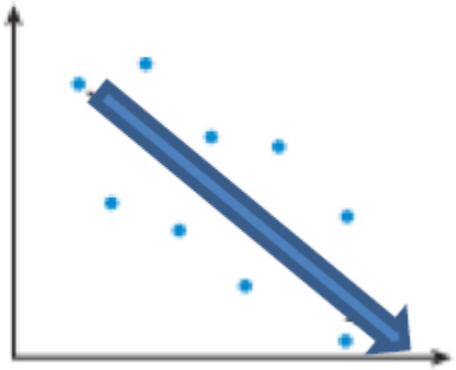
b) Juana wants to sell more than 1 million dollars worth of $1,000 laptops (*x*) and $2,000 desktop computers (*y*) this year.

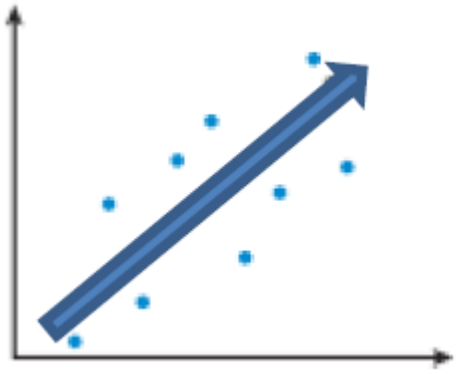
12. Write ***positive, negative***, or ***none*** to describe the correlation illustrated by each scatter plot. Also say if it is **strong** or **weak** Correlation if there is one.











13. For the scatter plots in problem 12, tell whether the correlation coefficient will be closer to -1, -0.5, 0, 0.5 or 1.

14. Tell whether the ordered pair is a solution of the given system.

a) $(3,1)$; $\begin{cases} x+3y=6 \\ 4x-5y=7 \end{cases}$ b) $(6,-2)$; $\begin{cases} 3x-2y=14 \\ 5x-y=32 \end{cases}$

15. Solve each system by graphing. Check your answer.

a) $\begin{cases} y=x+4 \\ y=-2x+1 \end{cases}$ Solution:_____ b) $\begin{cases} y=x+6 \\ y=-3x+6 \end{cases}$ Solution:_____

16. Write a System of Linear Equations and Solve by Graphing:

a) Maryann and Carlos are each saving for new scooters. So far, Maryann has $9 saved, and can earn $6 per hour babysitting. Carlos has $3 saved, and can earn $9 per hour working at his family's restaurant. After how many hours of work will Maryann and Carlos have saved the same amount? What will that amount be?

b) Sal earns $8 per hour. His sister Amie earns $20 per day plus $4 per hour. For how many hours of work in a day do Sal and Amie earn the same amount and how much will they earn? Solve by graphing.

c) Tom has 5 comic books in his collection and receives 5 new comic books each month. Joe has 145 comic books, but sends 5 to each of his 3 friends each month. In how many months will they have the same number of comic books? How many books will that be?

17. A consistent and dependent system is formed by the equations

y = 3x + 9 and

6x – 2y = A, where *A* is a real number. Find the value of *A*.

18. Write a system of equations to solve by **Substitution.**

a) A woman's age is three years more than twice her son's age. The sum of their ages is 84. How old is the son?

b) Mariko has 30 nickels and dimes. She has 12 more nickels than dimes. How many dimes does Mariko have?

c) The length of a rectangle is three times its width. The perimeter of the rectangle is 100 inches. What are the dimensions of the rectangle?

19. Write a system of equations to solve by **Elimination.**

a) A man and his three children spent $40 to attend a show. A second family of three children and their two parents spent $53 for the same show. How much does a child's ticket cost?

b) Efrem worked 40 hours at his two jobs last week. He earned $20 per hour at his weekday job and $18 per hour at his weekend. He earned $770 in all. How many hours did he work at each job?

c) Two pairs of socks and a pair of slippers cost $30. Five pairs of socks and a pair of slippers cost $42. How much does a pair of socks cost?

d) A theater charges $25 for adults and $15 for children. When the price of a child's ticket increases to $18 next year, the cost for a dance club to attend the theater will increase from $450 to $480. Write and solve a system of equations to find how many adults are in the dance club.

e) The sum of two numbers is 70. When the smaller number is subtracted from the bigger number, the result is 24. Find the numbers.

f) A newspaper and three hot chocolates cost $7. Two newspapers and two hot chocolates cost $6. How much does one coffee cost?

g) Ariel scored on 12 two-point and three-point shots. She scored 27 points in all. How many of each shot did Ariel make?

20. Solve by **Elimination.**

a) $\begin{aligned} 3x+2y&=12 \\ x+5y&=17 \end{aligned}$

b) $\begin{aligned} 5x&=3y+18 \\ 3x+5y&=4 \end{aligned}$

c) $\begin{aligned} -4x+7y&=11 \\ 4x-9y&=-13 \end{aligned}$

d) $\begin{aligned} x+y&=-10 \\ 5x+y&=-2 \end{aligned}$

21. Tell whether the ordered pair is a solution of the given system.

a) $(2,-2);\begin{cases} y<x-3 \\ y>-x+1 \end{cases}$

b) $(1,3);\begin{cases} y\le x+2 \\ y>4x-1 \end{cases}$

22. Graph the system of linear inequalities. Give two ordered pairs that are solutions. Give two ordered pairs that are not solutions.

a) $\begin{cases} y \le x + 4 \\ y \ge -2x \end{cases}$

b) $\begin{cases} y \le \frac{1}{2}x + 1 \\ x + y < 3 \end{cases}$

23. Write a system of inequalities and Solve by Graphing.

a) Charlene makes $10 per hour babysitting and $5 per hour gardening. She wants to make at least $80 a week, but can work no more than 12 hours a week. Graph the solutions of the system. List two possible combinations.

b) Coach Jules bought more than five bats. Some were wood and some were composite. The wood bats cost $49 each and the composite bats cost $100 each. Coach Jules spent less than $400. Write the system of equations that could be used to represent this situation. Let *w* stand for wood bats and *c* stand for composite bats.

24. Use two points to write an equation for each exponential function shown.

a)

x	0	1	2	3
***f*(*x*)**	6	18	54	162

b)

x	−2	0	2	4
***f*(*x*)**	84	21	5.25	1.3125

25. Starting with 25 members, a club doubled its membership every year. Write an exponential function, *f*(*n*), that expresses the number of members in the club after *n* years. Then find the number of members after six years.

26. An exponential function, *f*(*x*), passes through the points (2, 360) and (3, 216). Write an equation for *f*(*x*).

27. A town was founded with a population of 3000. The population then tripled every decade. Write the function, *p*(*n*), that expresses the town's population after *n* decades. Then find the population four decades after its founding.

28. Write an exponential growth or decay function to model each situation. Then find the value of the function after the given amount of time.

a) Annual sales for a fast food restaurant are $650,000 and are increasing at a rate of 4% per year; 5 years

b) The population of a town is 2500 and is increasing at a rate of 3% per year; 25 years

c) The value of a company's equipment is $25,000 and decreases at a rate of 15% per year; 8 years

d) A boat that cost $45,000 is depreciating at a rate of 20% per year; 10 years.

29. Identify whether the following tables represent a Linear or an exponential function. Give the Common difference or common ratio accordingly.

a)

x	$f(x)$
0	−2
1	1
2	4
3	7
4	10
5	13

b)

x	f(x)
-2	0.25
-1	0.5
0	1
1	2
2	4

c)

x	y
0	512
1	509
2	506
3	503

d)

x	f(x)
-2	81
-1	27
0	9
1	3
2	1/3

30. Write an explicit rule for each geometric sequence based on the given terms from the sequence. Assume that the common ratio r is positive.

a) $a_1 = 16$ and $a_3 = 4$ b) $a_1 = 2$ and $a_5 = 162$