

Name _____

Date _____

**ALGEBRA I / DATA ANALYSIS
MID YEAR REVIEW PROBLEMS**

1) Look at the sequence below:

-6, -1, 4, 9, _____, _____, _____, ...

Write the next 3 terms of the sequence.

2) What is the next term in the

sequence 121, 100, 79, 58, ...?

3) The table below shows the growth of Jack's stamp collection on Friday each week:

- Write an expression to model the number of stamps in the collection on Friday during week n .
- Predict the number of stamps in the collection on Friday during week 12.

Week	Number of stamps
1	10
2	16
3	22
4	28
...	...
...	...
n	

4) Solve each equation:

a) $-25 = -7 - 6k$

c) $7r - 2 = 48 - 3r$

e) $32 = \frac{n}{5} - 8$

g) $|2x + 3| = 21$

b) $4(c - 2) = -24$

d) $3d - 6(5 - 2d) = 105$

f) $15 = |6 - x|$

5) A TV repair person charges an initial \$30 for travel time to a service visit and then charges \$25 per hour of work. Write an equation that models the total cost (C) of a repair in terms of h , the number of hours worked.

6) Solve each inequality. Graph the solution set on a number line.

a) $3x - 2 \leq 13$

b) $-3(w + 4) < -27$

7) Use the formula $F = \frac{9}{5}C + 32$ to solve for degrees Fahrenheit if the temperature is 50° Celsius.

8) The freshman class has paid \$1000 for an order of calendars. They will sell the calendars for \$10.50 each.

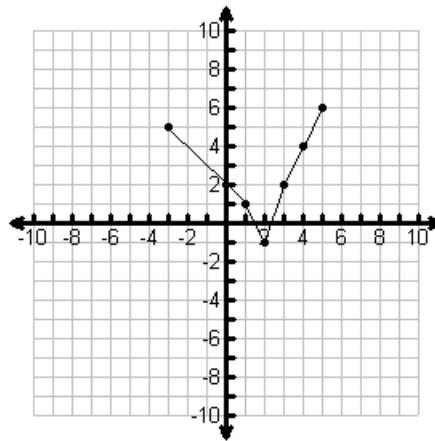
- Write an equation to show the relationship between the income (I) and the number (n) of calendars sold.
- What is the least number of calendars that must be sold in order to make a profit?

- 9) Company A rents compact cars for \$35 per day and then \$0.25 per mile of use. Company B rents compact cars for \$50 per day and then \$0.15 per mile of use.
- Write an equation to model the total cost to rent a compact car from Company A. Let $C =$ the total cost and $n =$ the number of miles used.
 - Write an equation to model the total cost to rent a compact car from Company B. Let $C =$ the total cost and $n =$ the number of miles used.
 - For how many miles do both companies charge the same amount of money? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.
 - If you plan to drive at least 160 miles, which company would you choose? Use mathematics to justify your answer.
- 10) A teacher has two Algebra classes with a total of 56 students. The ratio of the numbers of students in the two classes is 3:5. How many students are in the smaller class?

11) Look at the relations below.

a) $\{(8,4), (5,2), (8,3), (1,6)\}$

b)

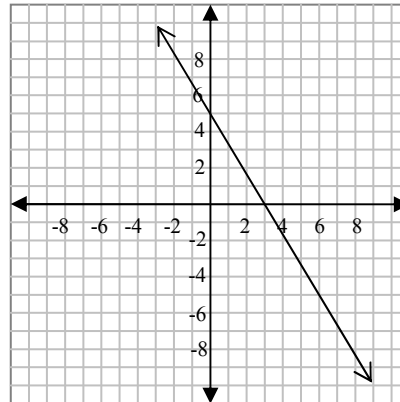


- Determine if each relation is a function. Use mathematics to justify your answer.
- Determine the domain and the range for each relation.

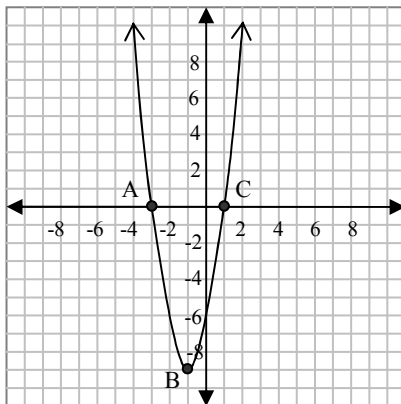
12) Find the rate of change **AND** the equation of the line, in slope-intercept form for each of the following:

a) line containing (8,-5) and (6,-3)

b) the graph below



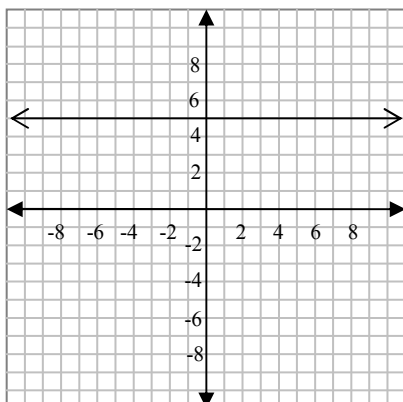
13) Use the graph below:



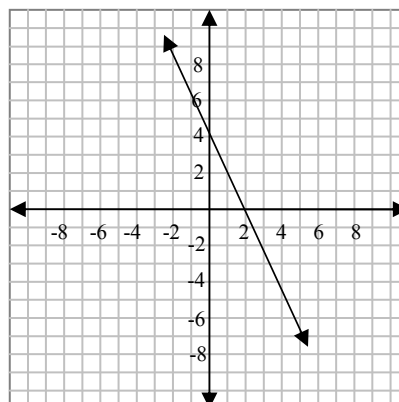
- Identify which point(s) represent(s) each of the following:
 a) Minimum: _____ b) Zero(s) _____

14) Write the equation of each graph below:

a)



b)



15) Write each of the following equations in standard form:

a) $y = 5x - 18$

b) $y = \frac{2}{3}x + 6$

16) Write each of the following equations in slope-intercept form:

a) $8x - 6y = 12$

b) $3x = 10 - 5y$

17) Determine if the lines below are parallel, perpendicular or neither.

a) $5x + 3y = 8$
 $3y - 5x = 12$

b) $4x + 2y = 10$
 $8x + 4y = 15$

18) Graph each of the following on a sheet of graph paper:

a) $y = -4x + 2$

b) $x = 8$

c) $y > 3x - 2$

d) $x + 2y \leq 4$

19) Use the data table to the right to do each of the following:

a) Create a scatter plot of the data on your own sheet of graph paper. Be sure to include a title, axes labels, units, and a constant scale.

b) Determine if the correlation is positive, or negative or if there is no correlation.

c) Find the line of best fit.

Use mathematics to explain how you determined your answer.

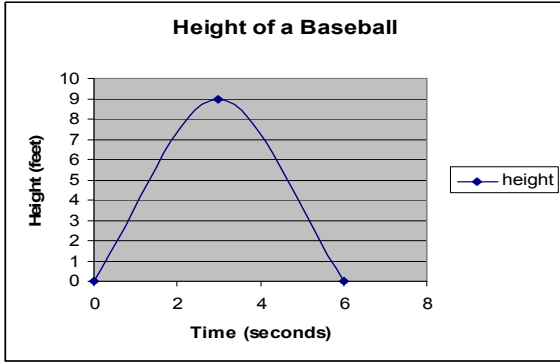
d) Use your equation to predict Jim's weight after

8 weeks of exercise. Use mathematics to explain how you determined your answer.

Use words, symbols, or both in your explanation.

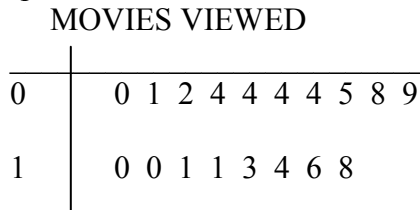
# of Weeks Of Exercise	Jim's Weight (lbs)
1	168
2	164
3	159
4	156
5	152
6	149
7	144

20) The graph below shows the height of a baseball.



- How long was the ball in the air? Use mathematics to explain how you determined your answer.
- What is the maximum height that the ball reaches?
At what time does the ball reach that height?

21) The stem-and-leaf plot below shows the number of movies that people have seen in the last month.



What is the mean number of movies viewed last month?

22) The matrices below show the inventory at two department stores:

	Columbia Old Navy
	Boys Girls
# shirts	$\begin{bmatrix} 18 & 6 \end{bmatrix}$
# jeans	$\begin{bmatrix} 12 & 14 \end{bmatrix}$

	Ellicott City Old Navy
	Boys Girls
# shirts	$\begin{bmatrix} 15 & 17 \end{bmatrix}$
# jeans	$\begin{bmatrix} 9 & 16 \end{bmatrix}$

- How many boys' shirts are there altogether?
- How many more girls' jeans are in Ellicott City than in Columbia?
- If the Columbia store triples its inventory, how many boys' shirts will be in the inventory?

23) The table below shows the orders at a basketball concession stand:

Costs at a Concession Stand

	Number of Hot Dogs	Number of Sodas	Total Cost
Order A	2	1	\$6.75
Order B	8	6	\$30.50

What is the cost of one hot dog?

24) Two number cubes are thrown. $P(\text{sum of } 7) = \underline{\hspace{2cm}}$

25) Solve these problems:

- a) 48 is what percent of 480? b) 15 is 60% of what number?

26) Using a simple random sample, the school government class found that 90 students in a survey of 100 students liked the idea of starting school later. Based on this survey, how many students in the whole school of 1400 students would be expected to like the idea of starting school later?

27) A marketing company conducted a survey by interviewing every tenth person who entered a particular grocery store between 10 a.m. and 11 a.m.

- Name two groups of people who are underrepresented in this survey.
- Is this a Simple Random Sample? Use mathematics to justify your answer.

28) Suppose that the probability of snow on Monday is 30%. The probability of snow on Tuesday is also 30%. A simulation was completed to predict the probability of snow on at least one of the two days. The digits 7, 8, 9 were used to indicate “snow”. The digits 0, 1, 2, 3, 4, 5, 6 were used to indicate “no snow”. The results of ten trials are shown below.

Simulation of Snow Days

Trial	Monday	Tuesday
1	2	6
2	8	6
3	6	4
4	5	1
5	3	6
6	9	2
7	0	3
8	2	2
9	3	4
10	4	1

- A. Describe one way in which you might perform this simulation.
- B. What is the experimental probability that it snowed on at least one of the two days?
- C. Would it be correct to assume that these results could be used to predict the probability of snow for the 30 days in a month? Use mathematics to justify your answer.

29) The data in the table below shows the number of motor vehicle thefts per 100,000 for eighteen regions with the highest theft rate in 1998.

STATE	MOTOR VEHICLE THEFT / 100,000	STATE	MOTOR VEHICLE THEFT / 100,000
Alaska	493	Massachusetts	528
Arizona	927	Michigan	701
California	761	Nevada	698
DC	1,837	New Jersey	581
Florida	721	New Mexico	582
Georgia	629	New York	494
Hawaii	605	Oregon	531
Louisiana	632	Texas	549
Maryland	711	Washington	522

Source: Statistical Abstract of the US, 1998

a) Construct a box-and-whisker plot for the data.

b) Supply the following information:

Minimum = _____ Q_1 = _____ Median = _____
 Q_3 = _____ Maximum = _____ Interquartile Range = _____

c) Are there any outliers in the data? Use mathematics to show how you determined your answer. Use words, symbols, or both in your explanation.

30) Martin caught 10 fish and recorded each of their weights as shown in the table below.

MARTIN'S FISH

WEIGHT OF FISH (in pounds)	FREQUENCY
2	3
3	1
5	1
6	4
32	1

a) What is the mean weight? _____

b) What is the median weight? _____

c) Should Martin use the mean or the median to best represent the typical weight of the fish he caught? Use mathematics to justify your answer.