

Algebra I Pre-AP -- Review Part Two for Fall Final Exam

Work problems on notebook paper without using a calculator, THEN practice using a calculator by checking your answers.

**Example 1:** a) Write a function rule for the data in the table below. b) Determine if the point  $(-9, 5)$  is on the graph of this function. c) Find  $x$  such that  $(x, 7)$  is on the graph of the function.

$x$	3	6	9	12
$y$	-3	-5	-7	-9

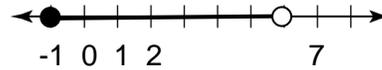
**Example 2:** Solve and graph  $8 - 3n \leq 22 - n$

**Example 3:** Determine whether the following represents a function and identify the domain and range:  $\{(2, -3), (-3, 2), (4, 2), (0, 0)\}$

1) Solve:  $6 - 3n < -18$

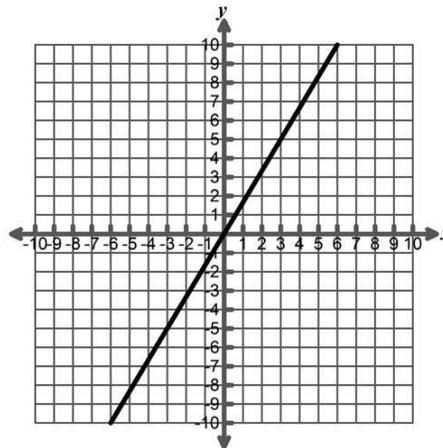
2) Solve:  $7x - 17 \leq -2(3x - 11)$

3) Write an inequality to describe this graph.



Game Show	
Week	Contestants
0	
6	<b>129</b>
17	
38	<b>33</b>

5) If the slope of the equation that represents the line below was multiplied by  $-2$  and the line was shifted down 4 units:  
 A) What would be the equation of this new line?  
 B) Describe the transformations from this line to the new line?



4) The table above show the number of contestants remaining on a reality television show as a function of the number of weeks since the show began. A) What is the function rule representing this situation? B) How many contestants are voted off each week (it is always the same)? C) How many contestants were on the show to begin with? D) In what week will the show crown its winner from the last contestants?

Use this information to answer questions 6a) – 6e) below: A water trough containing 60 gallons of water begins to leak. After 5 minutes, the trough contains only 35 gallons of water.

6a) Define the independent and dependent variables.

6b) What is the rate of change?

6c) Write a function rule for this situation.

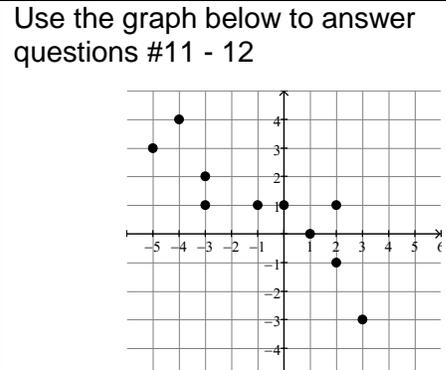
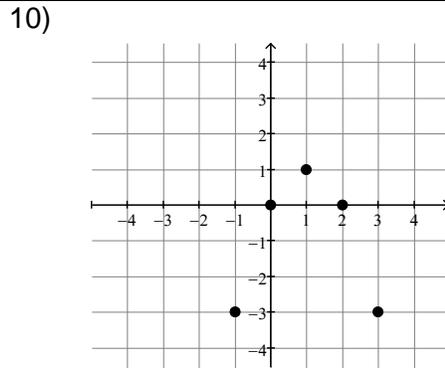
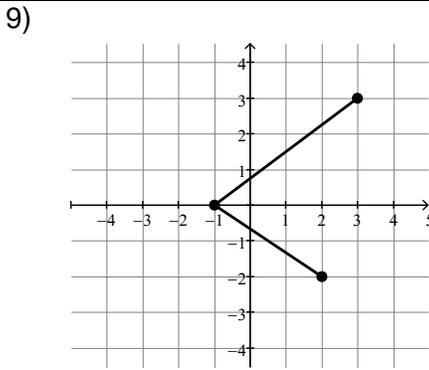
6d) Find both intercepts of the function and explain the meaning of each.

6e) State the domain and range of the function.

7) Suppose that  $m$  varies directly as  $n$ , and  $m = \frac{4}{5}$  when  $n = 2$ . Find the constant of variation and the equation that models this problem.

8) The amount that a spring will stretch,  $S$ , varies directly with the force,  $F$ , attached to the spring. If a spring stretches 3 inches with 30 pounds attached, write an equation to model this problem.

For #9 - 10, determine whether or not the graph represents a function.  
Then state the domain and range of each relation.



11) Does the graph represent a function? Explain.      12) Is the graph discrete or continuous?

Classify the data in #13 - 14 as discrete or continuous. Explain your answers.

13) Air temperature for a 24-hour period.      14) Number of croutons in your daily salad.

15) Write a function rule for the points (2, 5), (3, 9), and (4, 13).

Then; a) find  $x$  such that  $f(x) = 49$

b) find  $f\left(\frac{3}{4}\right)$

For #16 - 18, use the following information: Providing lunch will cost a fixed charge of \$25 plus \$7.50 per guest.

16) Identify the dependent and independent variables.      17) Write a function rule in function notation.

18) Identify as discrete or continuous. Then state the domain and range, assuming that there cannot be zero guests.

19) Find the slope of the line passing through:      a) (-5, 3) and (-7, 6);      b) (4, 7) and (4, -5).

20) A line has a slope of  $\frac{4}{3}$ . Through which ONE pair of points could this line pass?

[A] (-1, -2), (-5, 1)    [B] (-3, 4), (-1, 7)    [C] (7, -2), (1, 4)    [D] (5, 1), (2, -3)

21) Find the rate of change for the data in the table:

$x$	5	10	15	20
$y$	35	60	85	110

22) Change  $y - 8 = \frac{3}{7}(x + 4)$  to Standard Form.

23) Use your calculator's "Linear Regression Functions" to determine the answers to the following:

The table shows the time  $x$  (in hours) students spent watching reality television in the two days before the science final exam and the grade they received on the exam.

Time (hours) watching reality television, $x$	3	2	5	1	0	4	3
Grade on Science Final Exam, $y$	74	84	60	83	90	70	75

- Are the data representing a positive, negative or no correlation?
- What is the correlation coefficient for this data and INTERPRET what that "r" value means in context of the situation.
- Write the "line of best fit" equation that models exam grade as a function of the hours spent watching reality television.
- Interpret the meaning of the slope and the  $y$ -intercept of your "line of best fit".
- Estimate your grade on the science final exam if you watch 7 hours of reality television programs before the exam.

Answers

1) $n > 8$	2) $x \leq 3$	3) $-1 \leq x < 6$
4) A) $f(x) = -3x + 147$ B) Three contestants each week C) 147 contestants D) 49 weeks	5) A) $y = -\frac{10}{3}x - 4$ B) The new line would be reflected across the y-axis, rotated steeper and shifted down 4 units.	
6a) ind: $x = \#$ of minutes water has been draining; dep: $y = \#$ of gallons remaining in the trough.		
6b) $-5$ gallons/minute	6c) $y = 60 - 5x$	
6d) $x$ -int = $(12,0) \Rightarrow$ After 12 minutes, the trough is completely drained $y$ -int = $(0,60) \Rightarrow$ The trough originally contained 60 gallons.		
6e) $D = 0 \leq x \leq 20$ ; $R = 0 \leq y \leq 60$		
7) $\frac{2}{5}$ ; $m = \frac{2}{5}n$	8) $S = \frac{1}{10}F$	
9) Not a function $D = \{x: -1 \leq x \leq 3\}$ ; $R = \{y: -2 \leq y \leq 3\}$	10) Function $D = \{-1, 0, 1, 2, 3\}$ ; $R = \{-3, 0, 1\}$	
11) No -- fails the vertical line test.	12) Discrete	
13) Continuous (measured)	14) Discrete (counted)	
15) $f(x) = 4x - 3$ ; a) $f(13) = 49$ b) $f\left(\frac{3}{4}\right) = 0$	16) ind: $p = \#$ of people; dep: $C(p) = \text{Total cost}$	
17) $C(p) = 25 + 7.5p$	18) Discrete; $D = \{1, 2, 3, \dots\}$ ; $R = \{32.50, 40, 47.50, 55, \dots\}$	
19a) $-\frac{3}{2}$ b) Undefined (or No slope)	20) D	
21) 5	22) $3x - 7y = -68$	
23) a) negative correlation; b) $r = -.96975$ ; meaning there is a strong negative correlation; c) $y = -5.661x + 91.1$ ; d) Meaning that if you watched zero hours of reality television in the two day prior to the science final exam, you would score about a 91 on the exam. For every hour of reality television watched your grade on the exam would decline about 5 or 6 points. e) about a grade of 51		