Algebra 1-2: Representations and Functions
Unit 2 Test Study Guide

Name: _____Period: _____

1) Scott can ran a half-marathon (21.1 km) in 128 minutes.
   a. What was his pace, in miles per hour?   (1 km = 0.6214 miles)

   b. Connie's average running pace is a 9 minute mile. Who is faster? Explain.

2) Over summer vacation, Bryan has to read a novel for English class. He has decided to spend the same amount of time reading every day. The number of hours he spends reading every day will determine how many days it will take him to finish the book. Identify the independent and dependent variables of this situation and explain your choice.

   a. Independent variable: _____

   b. Dependent variable: _____

   c. Explain your assignment of the variables.

3) The graph shows the amount of rainfall during one storm. Describe what each segment represents?
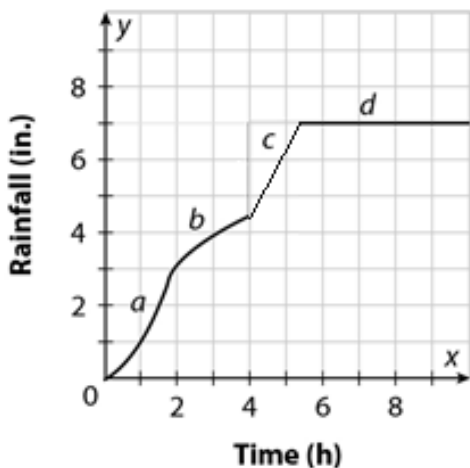
a.

b.

c.

d.

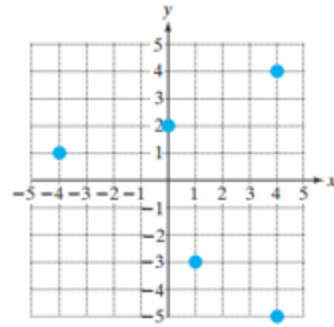**4)** For each relation, state the domain and range and then determine if the relations are functions.

x	3	5	7	5
y	4	−1	−6	−11

Domain: _____

Range: _____

Function: ○ Yes   ○ No

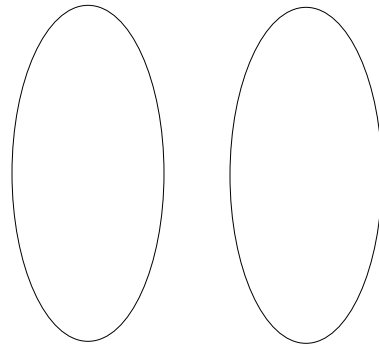Justify your answer:

Domain: _____

Range: _____

Function: ○ Yes   ○ No

Justify your answer:

5) Create a mapping diagram for the ordered pairs
$$\{(-1,5),(0,3),(1,5),(2,11),(3,21)\}$$

Is the relation a function?   ○ Yes   ○ No

6) Describe the difference between a graph that represents a function, and one that does not.   Then, draw an example of each.

7) The Unity Club is selling candles for $15 each. Since they make 30% on each candle, they earn a profit of $4.50 per candle.

    a.   Write a **function** for the **profit** made depending on the number of candles sold.

    b.   Adrianna thinks she can sell up to 8 candles. Find a reasonable domain and range for the profit from Adrianna's candle sales.

.

Domain: _____   Range: _____

8) Jenna leaves her house for school and travels at a pace of 3 miles per hour. After 20 minutes she realizes she forgot her cell phone, so she runs back home at twice her prior speed. It takes her 5 minutes at home to find her cell phone. She heads back out towards school on her bike, traveling 12 miles per hour for the entire 4 mile trip.

a. Determine if the graph be discrete or continuous (circle one)   *discrete*   *continuous*

b. The domain represents the variable _____ and goes from _____ to _____

c. The range represents the variable _____ and goes from _____ to _____

d. Use unit rates to graph each section. Label BOTH axes.
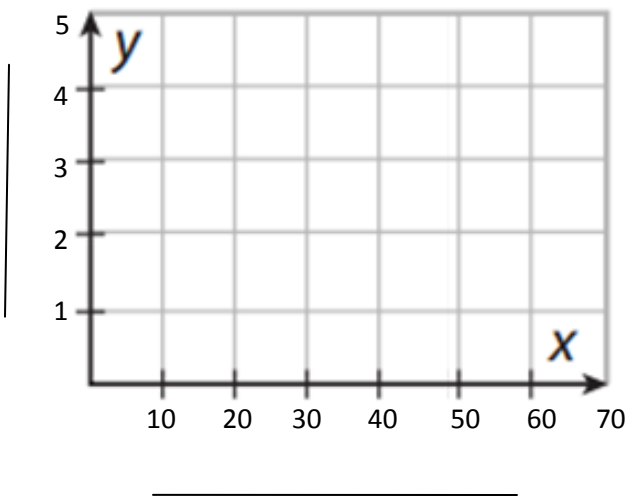
Section	Time (x)	Distance from home (y)

_____

9) A sanitation company charges $4 per bag for garbage pickup plus a $25 monthly fee.

a. Write a **function** that shows the cost of the sanitation service for *b* bags of garbage for a month.

b. The Bagel Shop has set a budget of $75 per month for sanitation. How many garbage bags can they produce and still remain within their budget?

10) The charge for a plumber is modeled by $C(h) = 45 + 35h$ where *h* is the number of hours the plumber spends on the job.

a. Find $C(6)$ _____

b. Interpret the meaning of $C(6)$ in the **context** of the problem. (Be specific interpreting both independent and dependent variables.)

11) The function below is expressed in words. Represent the function using a function rule and table.

Words:	**Table of Values**	**Function Rule:**

Tickets to a science museum cost $20 each. There is a $3 charge for each order no matter how many tickets are ordered.

12) The function below is expressed in a table. Represent the function using a function rule and words.

Words:	**Table of Values**	**Function Rule:**

(Create your own scenario that models the table.)

# People	Total Cost
0	15
5	75
10	135
15	195
20	255
25	315
30	375

13) A function below is expressed in a rule. Represent the function using a words and a table.

Words:	**Table of Values**	**Function Rule:**

(Create your own scenario that models the function rule.)

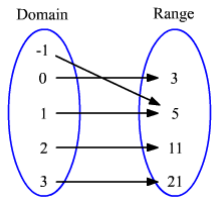|	

$$C(n) = 5.5n + 4$$

Where $C(n)$ represents the total cost of purchasing n tickets

Algebra 1-2: Unit 2 Test Study Guide Scoring Rubric

#	Answer	Points	Score	Scoring Notes
1.	a. Scott runs 6.15 miles per hour	2		1 for set up and 1 for answer
	b. Connie is faster. She runs 6.67 mph vs 6.15 mph for Scott.	2		1 point for converting to same units; 1 point for comparison/justification
2.	Independent: hours spent reading; Dependent: time to finish the book;	2		
	Justification: Time to finish depends upon daily time reading	1		
3.	a) Rain is falling at an increasing rate over 2 hours b) Rain is falling at an decreasing rate over 2 hours c) A heavy downpour d) The rain stopped, so the rainfall does not increase.	4		1 point each
4.	Table: Domain: {3, 5, 7}; Range: {-11, -6, -1, 4} Not a function; the input 5 has 2 different outputs Graph: Domain: {-4, 0, 1, 4}; Range: {-5, -3, 1, 2, 4} Not a function; the input 4 has 2 different outputs	6		½ point for each domain – correct numbers and order ½ point for each range - correct numbers and order 1 point for each conclusion and 1 point for each justification
5.	Yes it is a function	3		½ point for domain – correct numbers and order ½ point for range - correct numbers and order 1 point for correct mapping 1 point for "yes"
6.	The graph of a function does not have repeating x-values and therefore would pass a vertical-line test. The graph of a non-function would have one or more repeating x-values and would NOT pass a vertical line tests.	3		1 point for each description. ½ point for each graph demonstrating a function and non-function.
7.	a. $P(c) = 4.5c$ Any variable is acceptable	2		1 point for function notation; 1 point for correct formula.
	b. Domain: $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$	4		1 point for discrete lists 1 point for correct minimum value 1 point for correct maximum value 1 point for correct interim values
	c. Range: $\{0, 4.5, 9, 13.5, 18, 22.5, 27, 31.5, 36\}$			
8.	a. Continuous	1		
	b. $0 \leq \text{number minutes} \leq 55$	1.5		½ point for each
	c. $0 \leq \text{miles from home} \leq 4$	1.5		½ point for each
	d. Graph	4		1 point for each axis; 1 point for general shape; 1 point for accuracy
9.	a. $f(b) = 25 + 4b$	2		1 point for function notation; 1 point for correct formula.
	b. They can use no more than 12 bags	2		1 point for set-up; 1 point for solution
10.	$C(6) = 255$ The cost for a six hour plumbing job is $255.	3		1 point for solution; 2 points for explanation that includes independent and dependent variable explanation
11.	Function: $f(x) = 20x + 3$ Any variable is acceptable	2		1 point for function notation; 1 point for correct formula.
	Table with reasonable domain	1		Grade relative to function rule
12.	Words: Anything with a $15 flat fee and $12 per person fee.	2		Correct amounts with descriptions
	Function: $f(x) = 12x + 15$ Any variable acceptable	2		1 point for function notation; 1 point for correct formula.
13.	Words: Anything with a $4 flat fee and $5.5 per ticket fee.	1		
14.	Table with reasonable domain	1		
	Total Score	53		