Algebra I - Chapter 4 Test 1

What are the variables in each graph? Describe how the variables are related at various points on the graph.

1. The graph shows the height of a hiker above sea level. The hiker walks at a constant speed for the entire trip. What are the variables? Describe how the variables are related at various points on the graph.



- a. The variables are height and time. For the first part of the graph, the height is increasing slowly, which means the hiker is climbing a steep incline. Flat parts of the graph show where the elevation does not change, which means the hiker stopped to rest. The steep part at the end of the graph shows that the hiker is descending a gentle slope.
- b. The variables are height and time. For the first part of the graph, the height is increasing slowly, which means the hiker is walking up a gentle slope. Flat parts of the graph show where the elevation does not change, which means the trail is flat here. The steep part at the end of the graph shows that the hiker is descending a steep incline.
- c. The variables are height and time. For the first part of the graph, the height is increasing slowly, which means the hiker is climbing a steep incline. Flat parts of the graph show where the elevation does not change, which means the trail is flat here. The steep part at the end of the graph shows that the hiker is descending a steep incline.
- d. All of the above.

2. Lena makes home deliveries of groceries for a supermarket. Her only stops after she leaves the supermarket are at traffic lights and the homes where she makes the deliveries. The graph shows her distance from the store on her first trip for the day. What are the variables? Describe how the variables are related at various points on the graph.



3. The graph shows the number of handbags that Mandy made in one day. What are the variables? Describe how the variables are related at various points on the graph.



ID: A

4. A new comedian is building a fan base. The table shows the number of people who attended his shows in the first, second, third and fourth month of his career. Which graph could represent the data shown in the table?

Month	Total Number of People
1	119
2	214
3	385
4	693



5. The table shows the amount of money made by a summer blockbuster in each of the first four weeks of its theater release. Which graph could represent the data shown in the table?

Week	Money (\$)
1	19,600,000
2	7,800,000
3	3,100,000
4	1 300 000

6. A hiker climbs up a steep bank and then rests for a minute. He then walks up a small hill and finally across a flat plateau. What sketch of a graph could represent the elevation of the hiker?

- 7. Sketch a graph of the speed of a city bus on a daily route. Label each section.
 - A bus pulls away from a stop and increases speed
 - B bus is at a constant speed between stops
 - C bus is stopped
 - D bus increases speed after stopping

In the diagram below, what is the relationship between the number of rectangles and the perimeter of the figure they form?

c.

d.

8. Which of the following tables represent the relationship in the diagram above?

Number of Rectangles	Perimeter
1	52
2	72
3	92

Number of Rectangles	Perimeter
1	26
2	36
3	46

b.

a.

Number of Rectangles	Perimeter
1	13
2	18
3	23

Number of Rectangles	Perimeter
1	26
2	44
3	62

9. Which of the following graphs represents the relationship described above?

10. Represent the relationship above using words. What is an equation for this relationship?

In the diagram below, what is the relationship between the number of triangles and the perimeter of the figure they form?

- 11. Which of the following represents the above relationship?
 - a. The perimeter, P, is equal to the length of the base of one triangle multiplied by the number of triangles in the figure, n, plus two times the length of another side. The equation for the perimeter is P = 5n + 14.
 - b. The perimeter, P, is equal to the length of the base of one triangle multiplied by the number of triangles in the figure, n, plus the length of another side. The equation for the perimeter is P = 5n + 7.
 - c. The perimeter, P, is equal to the length of a side of one triangle multiplied by the number of triangles in the figure, n, plus the length of the base. The equation for the perimeter is P = 7n + 5.
 - d. The perimeter, P, is equal to the length of a side of one triangle multiplied by the number of triangles in the figure, n, plus two times the length of the base. The equation for the perimeter is P = 7n + 10.
 - 12. Suppose you know the perimeter of *n* triangles. What would you do to find the perimeter of n + 1 triangles?
 - a. Add 5 to the perimeter of *n* triangles
 - b. Add 14 to the perimeter of *n* triangles
 - c. Add 10 to the perimeter of *n* triangles
 - d. Add 7 to the perimeter of *n* triangles
 - 13. Represent the above relationship by filling in the table below.

Number of Triangles	Perimeter
1	
2	
3	

14. Represent the above relationship by drawing a graph.

15. Represent the relationship between the number of triangles and the perimeter of the figure they form as an equation. How does this equation relate to the method you would use to find the perimeter of n + 1 triangles from the perimeter of n triangles?

The table shows the relationship between the number of sports teams a person belongs to and the amount of free time the person has per week.

Number of Sports Teams	Free Time (hours)
0	41
1	38
2	35
3	32

_ 16. Is the above relationship a linear function?

a. yes

b. no

18. Describe the above relationship using words. What is the equation for this relationship?

What is the graph of the function rule?

20. A taxi company charges passengers \$1.00 for a ride, and an additional \$0.30 for each mile traveled. The function rule C = 0.30m + 1.00 describes the relationship between the number of miles m and the total cost of the ride c. If the taxi company will only go a maximum of 40 miles, what is a reasonable graph of the function rule?

Write a function for the situation. Is the graph continuous or discrete?

- 21. A movie store sells DVDs for \$11 each. What is the cost, C, of n DVDs?
 - C = 11n; continuous a. C = 11 + n; discrete b.
- c. C = 11 + n; continuous d. C = 11n; discrete

- 22. A produce stand sells roasted peanuts for \$1.90 per pound. What is the cost, C, of p pounds of peanuts?
 - a. C = 1.90p; continuous
- c. C = 1.90 + p; continuous

C = 1.90p; discrete b.

d. C = 1.90 + p; discrete

What is the graph of each function rule?

Name: _____

27. Model the function rule $y = \frac{1}{6}x + 3$ with a table of values and a graph.

x	у
-1	
0	
1	

28. Model the function rule y = -11x + 6 with a table of values and a graph.

x	у
-1	
0	
1	

Name:

29. Elaine has a business repairing home computers. She charges a base fee of \$30 for each visit and \$35 per hour for her labor. The total cost C for a home visit and x hours of labor is modeled by the function rule C = 35x + 30. Use the function rule to make a table of values and a graph.

x	С
0	
1	
2	
3	

 $\mathbf{\uparrow}C$

