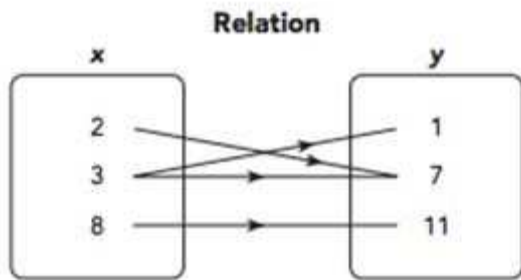# Review for Quest #8 - Linear and Nonlinear Functions
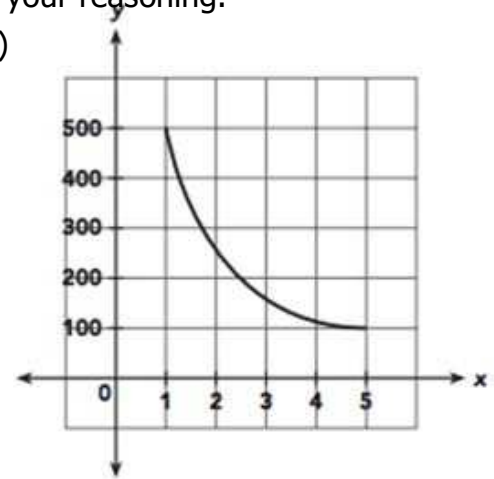
Name _____ Class _____

1.) Determine if the following relations are functions. Explain your reasoning.
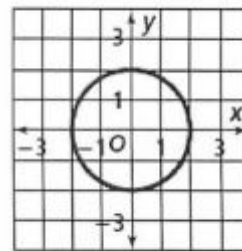
a.)
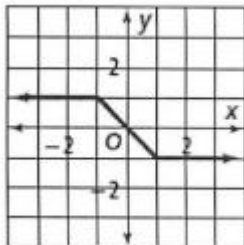
Relation

b.)

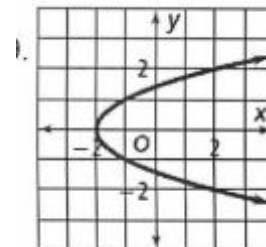c.) $\{(1,1),(2,2),(3,5),(4,10),(5,15)\}$

d.)

e.)

f.)

2.) Determine whether the relations below are linear or nonlinear. Explain your reasoning.

a.) $y = 2x - 5$

b.) $y = -3x^2 - 4$

c.) The equation $V = e^3$ gives the volume of a cube as a function of its edge length, $e.$

d.)

Input, Time (min)	1	2	3	4
Output, Temperature (°F)	−1	−2	−3	−4

1

3.) Joey and Peter each pay a fixed amount each month to use a cell phone. They each also pay
for each minute that they make calls on the phone.

    a.) The graph shows the amount, y dollars, Joey pays in a given
month, based on the airtime, x minutes, he uses to make
calls. Write an equation that represents how much Joey
pays in y dollars each month based on x minutes of airtime.
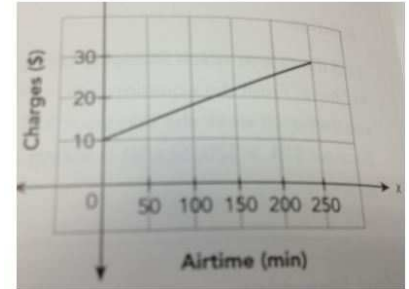
    b.) Peter pays $20 each month and pays $0.05 per minute. Write an equation that represents
how much Peter pays in y dollars each month based on x minutes of airtime.

    c.) Who pays a greater initial fee? Explain.

    d.) Who pays more per minute? Explain.

4.) The table shown represents a linear function.

    a.) Find the slope and the y-intercept of the function.

x	y
-4	2
0	5
4	8
8	11

    b.) Which equation has a greater slope and a greater y-intercept than the
linear function shown in the table? **(4 points)**

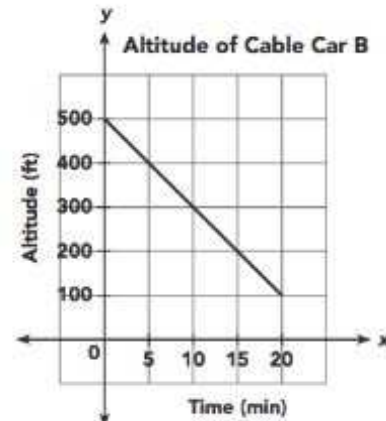   (A) $y = x + 4$ (C) $y = \dfrac{3}{4}x + 5$

        (B) $y = 2x + 6$ (D) $y = \dfrac{1}{2}x + 8$

        Explanation:

2

5.) Two cable cars are descending from two separate stations. The altitude, y feet, of Cable Car A after x minutes is given in the table shown below. The graph below shows the altitude, y feet, of Cable Car B after x minutes.

Cable Car A

Time (min)	Altitude (ft)
0	600
5	450
10	300
15	150
20	0

a.) Determine an equation to model the path of Cable Car A.

b.) Determine an equation to model the path of Cable Car B.

c.) Which cable car is descending from a higher altitude? Justify your answer.

d.) Which cable car is descending at a faster rate? Justify your answer.

e.) How long will it take for the two cable cars to have the same altitude? What will that altitude be?

6.) Veronica created two functions.

For Function A, the value of y is seven less than three times the value of x. The table included represents Function B. In comparing the average rates of change, which statement about Function A and Function B is true?

Function B

x	y
-4	5
-1	11
2	17
5	23

(A) Function A and Function B have the same rate of change.

(B) Function A has a greater rate of change than Function B.

(C) Function B has a greater rate of change than Function A.

(D) Function A and Function B both have a negative rate of change.