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Mid Unit 4 Study Guide

Solve the problems.

1.

The table represents the area, *y* square units, of a square with side lengths of *x* units.

Does the table represent a linear function? Explain why or why not.

Table

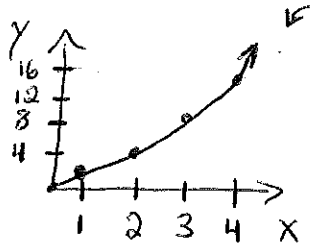
x	y	
0	0	+1
1	1	+3
2	4	+5
3	9	+7
4	16	

(+1 between each pair of x-values)

Equation $y = x^2$ Exponent means non linear

Explain
- linear has constant rate of change
- non linear does not have a constant rate of change

graph



Curved line when graphing, means not linear

2.

Write an equation that is not a linear function. Explain why it is not linear.

$y = x^3 + 1$

Exponent means rate of change is not constant

$y = \frac{5}{x}$ x in denominator means not a constant rate of change

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Linear $y = 3x + 5$

Constant rate of change

$y = \frac{6}{7}x - 5$

Constant rate of change

3.

A county park charges a $175 fee to rent a pavilion plus $20 per guest.

Part A

Write an equation for this function.

$y = 20x + 175$

Part B

What do the slope and *y*-intercept represent?

slope = 20 means $\$20/1$ person

y-intercept = (0, 175) fee for renting

4.

To change a temperature in degrees Fahrenheit, *F*, to a temperature in degrees Celsius, *C*, the equation $C = \frac{5}{9}F + \left(-\frac{160}{9}\right)$ can be used.

Part A

Explain how you know the equation represents a linear function.

Constant rate of change $\frac{5}{9}$

Part B

What are the slope and the *y*-intercept of this function? What do they represent in the context of the situation?

slope = $\frac{5}{9}$ means every 1 degree fahrenheit Celcius increases by $\frac{5}{9}$

y-intercept = $\left(0, \frac{-160}{9}\right)$ zero degrees $F = \frac{-160}{9}°C$

5.

Which equation represents a linear function? Choose all that apply.

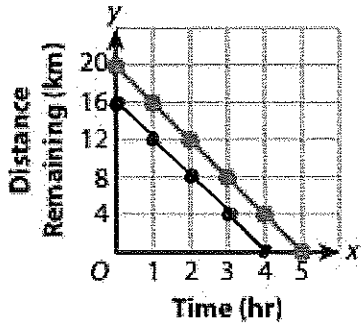
A $y = x \cdot x$

B $y = 2x$

C $y = 0.25x + 4$

6.

Write an equation for the function shown in the graph. Identify the slope and the y-intercept. Then graph a different linear function that has the same slope as the function shown. Write an equation for your function.



$y = 20 - 4x$

or

$y = -4x + 20$

2nd Equation

$y = -4x + \underline{16}$

↑ can be any number

7.

For each table, write in the equation that represents the price per ticket.

Tickets, x	3	4	5	6
Price ($), y	27.75	37	46.25	55.50

unit rate

$\frac{27.75}{3} = 9.25$

$y = 9.25x + 0$

Tickets, x	2	3	4	5
Price ($), y	12	18	24	30

$\frac{12}{2} = 6$

$y = 6x$

8.

Filipe is paid $1,000 every month plus an additional $150 bonus for every tractor he sells, x. Write an equation to represent the total amount of money, y, Filipe makes each month.

What does the slope represent?

$y = 1{,}000 + 150x$

150 is slope
$150 for each tractor

What does the y-intercept represent?

(0, 1000)

$1,000 for ~~each~~ monthly salary

Notes

vocab?

- slope
- rate of change
- y-intercept
- initial value
- function
- linear function
- non linear function
- unit rate
- proportional relationship

$$\frac{y_2 - y_1}{x_2 - x_1}$$

Describe each lesson

Lesson 6

What is a function

Lesson 7

Compare functions

Lesson 8

Linear vs Non Linear $y = mx + b$ Form

Lesson 9

Analyze linear functions

Slope and y-intercept

Lesson 11

Proportional relationships

unit rate is slope