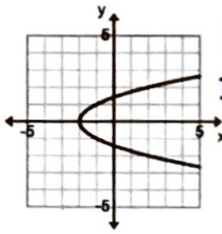


Name: \_\_\_\_\_ Period: \_\_\_\_\_

Score: \_\_\_\_\_ / \_\_\_\_\_ %

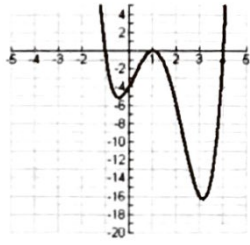
## Unit 3 Review

1. Is it a function? Why?



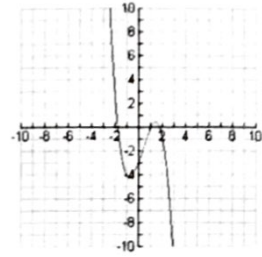
NO.  
Fails the  
V.L.T.

2. Is it a function? Why?



Yes  
passes the  
V.L.T.

3. Is it a function? Why?



Yes  
passes  
the  
V.L.T.

State the domain and range. Is it a function? Why?

4.

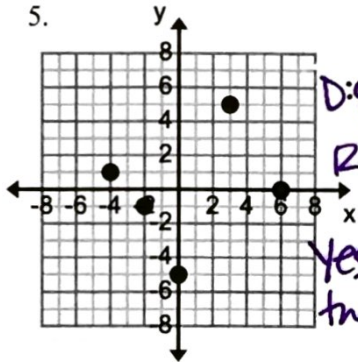
$\{(6,1), (-3,8), (1,-3)\}$

D:  $\{-3, 1, 6\}$

R:  $\{-3, 1, 8\}$

YES. Each x value  
is different.

5.



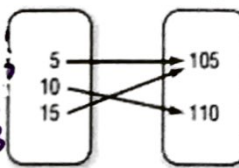
D:  $\{-4, -2, 0, 3, 6\}$

R:  $\{-5, -1, 0, 1, 3\}$

Yes! Passes  
the V.L.T.

6.

Domain Range



Yes.  
Because  
each input  
has exactly  
one output

D:  $\{5, 10, 15\}$

R:  $\{105, 110\}$

7.

x	y
-3	0
-1	-1
0	0
2	-2
3	4

D:  $\{-3, -1, 0, 2, 3\}$

R:  $\{-2, -1, 0, 4\}$

Yes, each x  
value is  
different

8.

x	y
-2	-1
-2	1
-1	0
1	0
2	1

D:  $\{-2, -1, 1, 2\}$

R:  $\{-1, 0, 1\}$

NO - the x value  
-2 has 2 different  
y values.

9.

$\{(4,-2), (-6,1), (0,7), (4,3), (-5,0)\}$

D:  $\{-6, -5, 0, 4\}$

R:  $\{-2, 0, 1, 3, 7\}$

NO! the x value 4  
has 2 different  
y values.

Find the rate of change or slope of the line.

10.

x	y
2	6
5	10
8	14
11	18

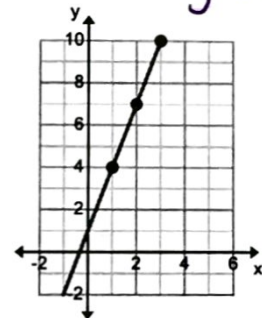
$\frac{4}{3}$

11.

$\{(2,6), (3,8), (4,10)\}$

$\frac{2}{1}$

12.



$\frac{3}{1}$

13. From questions 10 - 12 which has the greatest slope? Why?

#12 because 3 is greater than  $\frac{2}{1}$  and  $\frac{4}{3}$

14. Jack is on a road trip with David. David has already driven 100 miles, and Jack will drive 65 miles per hour. Write an equation to calculate how many miles they have driven according to how long Jack has driven.

a. What is the rate of change for the situation? *65 miles per hour*

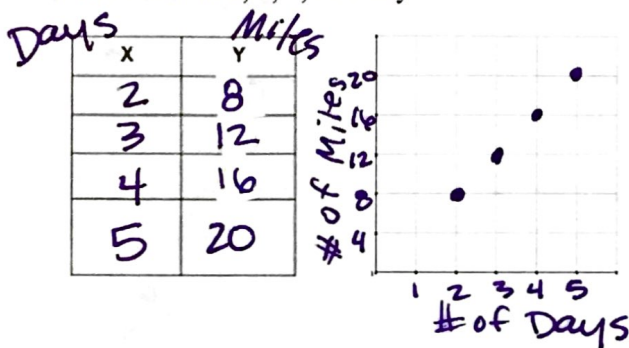
b. What is the initial value for the situation? *100 miles*

c. Write an equation to model the situation.  $y = 65x + 100$

15. John started a new exercise plan and he decides to bike 4 miles each day.

a. Make a table and graph to find the number of total miles biked in 2, 3, 4, or 5 days.

b. Write an equation model the total number of miles biked ( $y$ ) in any number of days ( $x$ ).



$$y = 4x$$

16. Carmen pays a swimming instructor for private lessons. The instructor charges an initial fee and a constant amount per hour. Carmen paid \$237 for six hours of instruction. Then for eight hours of instruction she paid \$311. Assume the relationship is linear.

a. Make a table of the situation.

$x$ : # of hours of instruction	$y$ : cost \$
1	52
2	89
3	126
4	163
5	200
6	237
7	274
8	311

b. Write an equation to model the situation.

$$y = 37x + 15$$

c. Interpret the slope.

*37*  
It costs \$37 per hour of instruction.

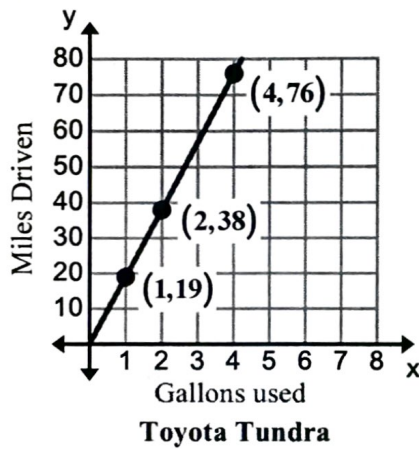
d. Interpret the  $y$ -intercept.

*15*  
The initial fee is \$15.

17. John buys a plant. After one month the plant is 5.5 inches tall. After 3 months the plant is 6.5 inches tall. Assume the relationship is linear.

<p>a. Make a table of the situation.</p> <table style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;"><math>x</math>: # of months</td> <td style="padding: 5px;"><math>y</math>: # of inches</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">0</td> <td style="padding: 5px; text-align: center;">5</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">1</td> <td style="padding: 5px; text-align: center;">5.5</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">2</td> <td style="padding: 5px; text-align: center;">6</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">3</td> <td style="padding: 5px; text-align: center;">6.5</td> </tr> </table>	$x$ : # of months	$y$ : # of inches	0	5	1	5.5	2	6	3	6.5	<p>b. Write an equation to model the situation.</p> $y = .5x + 5$
$x$ : # of months	$y$ : # of inches										
0	5										
1	5.5										
2	6										
3	6.5										
<p>c. Interpret the slope.</p> <p style="font-size: 1.2em; margin-left: 20px;">The plant grows 0.5 inches each month.</p>	<p>d. Interpret the <math>y</math>-intercept.</p> <p style="font-size: 1.2em; margin-left: 20px;">The plant was 5 inches tall when John bought it.</p>										

18. A Toyota Camry has a gas mileage of 24 miles per gallon. The gas mileage of a Toyota Tundra is represented by the graph below. Compare and interpret their gas mileage.



a. What is the gas mileage for the Toyota Camry?

24 miles per gallon

b. What is the gas mileage of the Toyota Tundra?

19 miles per gallon

c. Compare and interpret their gas mileage.

The Camry gets better gas mileage because it can go more miles on 1 gallon of gas.

19. Mark is playing his dad in a game of basketball. His dad gives him some points to start the game. Mark's score is represented by the function  $p = 2b + 3$ , where  $p$  is the number of points scored and  $b$  is the number of baskets made. His dad's score is shown in the table below.

Mark's Dad	
Baskets Made ( $b$ )	Points Scored ( $p$ )
1	2
2	4
3	6
4	8
5	10

a. Compare the functions by comparing their  $y$ -intercepts and rates of change.

$Y$ -int. Dad's greater because  $3 > 0$ .

$R.O.C.$  They are the same. Both are 2.

b. How many points will Mark have if he makes 20 baskets?

43 points

Determine whether the graphs below are *linear* or *nonlinear*. Explain how you know.

20.

X	Y
1	28
2	24
3	20
4	16
5	12

LINEAR  
Has a CROC of  $\frac{4}{1}$

21.

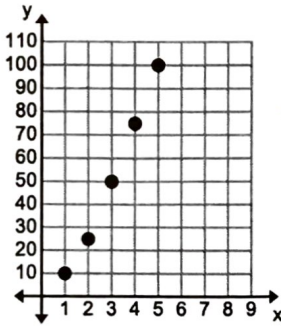
X	Y
1	1
4	5
7	10
10	16
13	23

NON-LINEAR.  
NO CROC

$\frac{4}{3} \neq \frac{5}{3} \neq \frac{6}{3} \neq \frac{7}{3}$

Determine whether the graphs below are *linear* or *nonlinear*. Explain how you know.

22.



NONLINEAR  
the points  
curve.

23.  $\{(0,0), (5,15), (10,30), (15,45), (20,60)\}$

LINEAR  
the CROC is  $\frac{15}{5} = \frac{3}{1}$

24. There are 1,440 minutes in a day. The total minutes is a function of the days. Does this situation represent a linear or nonlinear function? Explain.

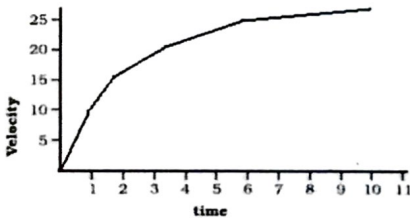
Yes. LINEAR. Time moves at a constant rate.

25. Circle all of the equations that are linear.

$y = 7 - 2x$	$y = x^2 + 7$	$y = \frac{x}{5} + 7$	$y = 7$	$5x + 7y = 10$	$y =  x  + 7$
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**Qualitative graphs**

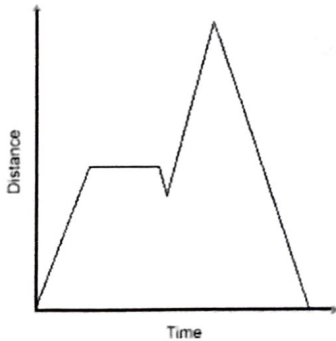
26. The graph below displays Jacob's velocity during his morning run. Describe the change in the velocity as time went on.



Speed

As time goes on, Jacob's speed goes down. At first he speeds up, then isn't gaining as much speed.

27. Use the graph below which displays the distance that Tanya hiked away from her campsite.

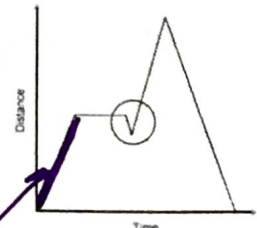


a. What situation could the horizontal line segment represent?

Tanya stopped to rest.

b. What does the small decrease after the horizontal line represent in this situation?

she went back a little on her hike towards camp then kept hiking again.

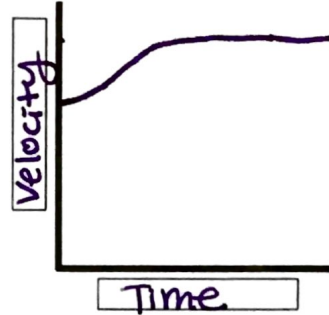


c. Did Tanya's distance increase or decrease during the first portion of her hike? Explain.

increased.

she's increasing in distance

28. Randy rides his skateboard down a vertical ramp. He starts off with a lot of velocity but then levels out at a constant velocity when he hits the ground. Sketch a qualitative graph to represent this situation.



Translate each sentence into an equation. Then solve.

29) One-fourth of a number less sixty is 8.

$$\frac{1}{4}x - 60 = 8$$

30) Seven less than 4 times a number is 9.

$$4x - 7 = 9$$

31) The quotient of a number and 10, plus 14, is 6.

$$\frac{x}{10} + 14 = 6$$

32) Jerome completes 8 extra credit problems on the first day and then 4 problems each day until the worksheet is complete. There are 28 problems on the worksheet. Write and solve an equation to find how many days it will take Jerome to complete the worksheet after the first day.

Equation(s):

$$8 + 4x = 28$$

Solution:

$$x = 5 \text{ more days}$$

33) The Yeoman family spent a total of \$35.50 on lunch. They bought 5 drinks and 3 sandwiches. Each drink costs \$2.50 less than a sandwich. Write an equation that could be used to find the cost of each sandwich.

Equation(s):

$$35.50 = 3x + 5(x - 2.50)$$

Solution:

$$x = 6$$

Each sandwich costs \$6

34) The Peterson family takes a ferry from Seattle to Vancouver Island in Canada. They are charged a fee for the vehicle and also a per passenger rate. On the boat ride to the island there are 9 people in the van and the charge is \$228.70. Some of the family members do not ride the ferry back so there are just 6 people in the van on the return trip and the cost is \$170.35. Assume the situation is linear.

<p>a. Make a table of the situation.</p> <p style="text-align: center;">See below</p>	<p>b. Write an equation to model the situation.</p> $y = 19.45x + 53.65$
<p>c. Interpret the slope.</p> <p style="text-align: center;">19.45</p> <p style="text-align: center;">It cost \$19.45 per person</p>	<p>d. Interpret the y-intercept.</p> <p style="text-align: center;">53.65</p> <p style="text-align: center;">It cost \$53.65 for the van to ride the ferry.</p>

①

X: # of passengers	y: rate \$
0	53.65
1	73.10
2	92.55
3	112.00
4	131.45
5	150.90
6	170.35
7	189.80
8	209.25
9	228.70