

# Unit 3 Review

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

Form of a line	Slope-Intercept	Point-Slope	Standard
Equation	$y = mx + b$	$y - y_1 = m(x - x_1)$	$Ax + By = C$
What information do you need to write the equation?	slope (m) y-intercept (0, b)	slope (m) point $(x_1, y_1)$	n/a
What information can you use to graph the equation?	① mark the y-intercept this is your starting point ② use the slope (rise/run) to find a second point	① plot the point ② use the slope to find another point	① find the x-intercept (plug 0 in for y) + plot the point ② find the y-intercept (plug 0 in for x) + plot the point

1) Determine which tables represent a linear relationship.

is change in y change in x the same?

x	y
0	-4
1	-2
4	4
10	16

$\frac{2}{1} = 2$     $\frac{6}{3} = 2$     $\frac{12}{6} = 2$

linear

Graph each of the functions.

x	y
-1	3
0	6
1	9
2	12

$\frac{3}{1} = 3$     $\frac{3}{1} = 3$     $\frac{3}{1} = 3$

linear

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

$-\frac{1}{1} = -1$     $\frac{1}{-1} = -1$     $\frac{3}{-1} = -3$

not linear

x	y
2	7
4	15
8	31
10	39

$\frac{8}{2} = 4$     $\frac{16}{4} = 4$     $\frac{8}{2} = 4$

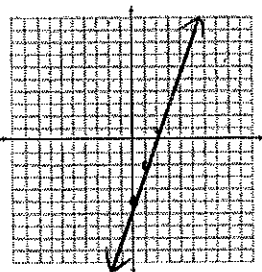
linear

x	y
0	3
1	3
2	3
4	3

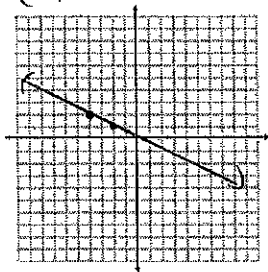
$\frac{0}{1} = 0$

linear

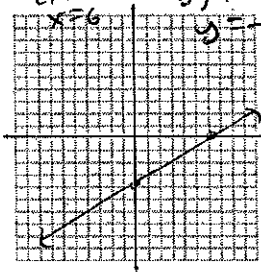
2)  $y = 3x - 5$   
 $m = 3$     $b = -5$



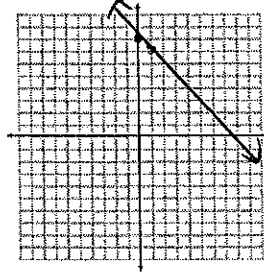
3)  $y - 2 = -\frac{1}{2}(x + 4)$   
 $(-4, 2)$     $m = -\frac{1}{2}$



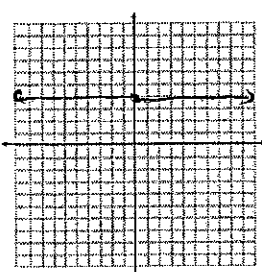
4)  $2x - 3y = 12$   
x-int:  $2x = 12$     $x = 6$   
y-int:  $-3y = 12$     $y = -4$



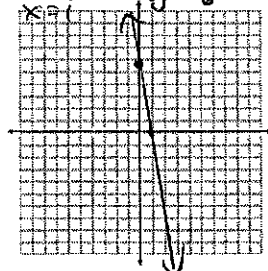
5)  $y = -x + 8$   
 $m = -1$     $b = 8$



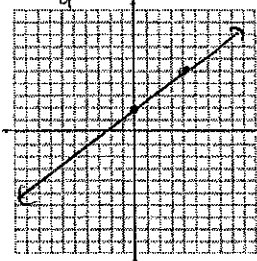
6)  $y = 4$   
horizontal line



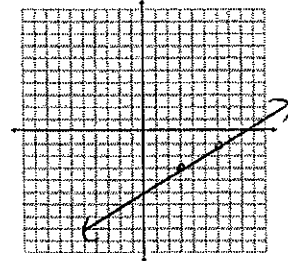
7)  $6x + y = 6$   
x-int:  $6x = 6$     $x = 1$   
y-int:  $y = 6$



8)  $y = \frac{3}{4}x + 2$   
 $m = \frac{3}{4}$     $b = 2$



9)  $y + 3 = \frac{2}{3}(x - 3)$   
 $m = \frac{2}{3}$     $(3, -3)$



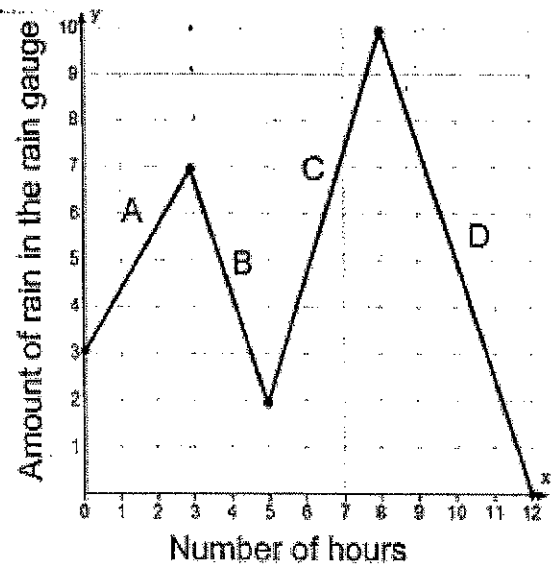
10) Complete the table.

*go backwards in your table since you know the slope is 2*

Linear Relationship	Slope-Intercept	Point-Slope	Intercepts
	$Slope = \frac{2}{1} = 2$ $b = 2$ $y = 2x + 2$	$y - 4 = 2(x - 1)$	x-intercept: $(-1, 0)$ y-intercept: $(0, 2)$
	$Slope = \frac{10}{2} = 5$ $y = 5x + 10$	$y - 0 = 5(x + 2)$	x-intercept: $(-2, 0)$ y-intercept: $(0, 10)$
	$y = \frac{1}{2}x - 4$	$y + 4 = \frac{1}{2}(x - 0)$	x-intercept: $(9, 0)$ y-intercept: $(0, -4)$
	$y = \frac{3}{2}x - 3$	$y - 0 = \frac{3}{2}(x - 2)$	x-intercept: $(2, 0)$ y-intercept: $(0, -3)$

11) The amount of rain in a rain gauge during a 12-hour period is shown in the graph to the right. Write a general description of what is happening during this time period.

it rains for 3 hours  
 then the water evaporates  
 for 2 hours.  
 it rains again for 3 hours  
 & then the water takes  
 4 hours to evaporate



12) Find the numerical value of the slope of each segment.

Slope of A:  $\frac{4}{3}$

Slope of B:  $-\frac{5}{2}$

Slope of C:  $\frac{8}{3}$

Slope of D:  $-\frac{10}{4} = -\frac{5}{2}$

13) Write the equation of each line segment in slope intercept form.

Line A:  $y = \frac{4}{3}x + 3$

Line C:  $y = \frac{8}{3}x - 11.\bar{3}$

Line B:  $y = -\frac{5}{2}x + 14.5$

Line D:  $y = -\frac{5}{2}x + 30$

14) Write the equation of each line segment in point-slope form:

Line A:  $y - 7 = \frac{4}{3}(x - 3)$

Line C:  $y - 10 = \frac{8}{3}(x - 8)$

Line B:  $y - 7 = -\frac{5}{2}(x - 3)$

Line D:  $y - 10 = -\frac{5}{2}(x - 8)$

15) State the x-intercept and its meaning.

$(12, 0)$   
 at 12 hours,  
 there is no  
 rain in the  
 rain gauge

16) State the y-intercept and its meaning.

$(0, 3)$   
 amount of rain  
 in the rain gauge  
 at the start

17) Does each part of the graph consist of linear relationships? Why or why not? *yes. All parts are linear because they are lines.*

18) Find the numerical value of the slope of each segment.

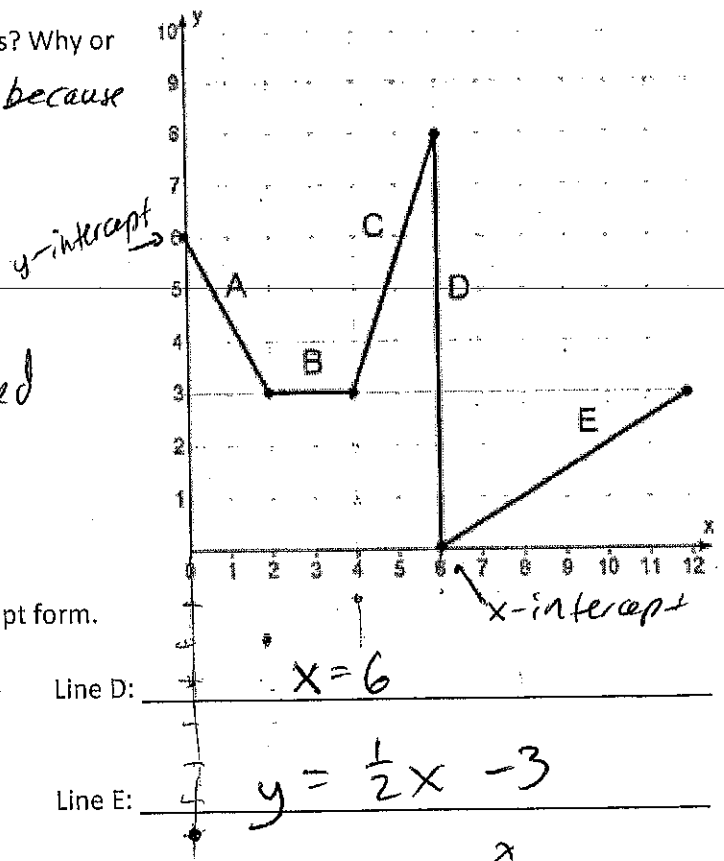
Slope of A:  $-\frac{3}{2}$

Slope of B:  $0$

Slope of C:  $\frac{5}{2}$

Slope of D: *undefined*

Slope of E:  $\frac{1}{2}$



19) Write the equation of each line segment in slope intercept form.

Line A:  $y = -\frac{3}{2}x + 6$

Line D:  $x = 6$

Line B:  ~~$y = -\frac{3}{2}x + 6$~~   $y = 3$

Line E:  $y = \frac{1}{2}x - 3$

Line C:  $y = \frac{5}{2}x - 7$

*follow the lines back to the y-axis to determine the y-intercepts*

20) State and label the x-intercept.

$(6, 0)$

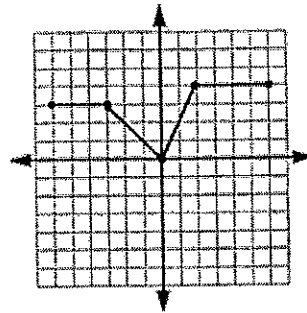
21) State and label the y-intercept.

$(0, 6)$

The graph of the parent function  $f(x)$  is given.

22) State the domain and range for this function.

Domain:  $[-6, 6]$  Range:  $[0, 4]$



Graph each of the transformations and state the new domain and range.

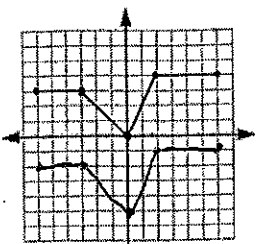
Describe the effect of the following transformations on the parent function.

23)  $f(x) - 5$   
*down 5*

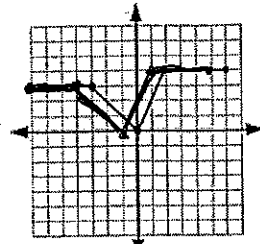
24)  $f(x + 1)$   
*left 1*

25)  $f(x - 1) + 2$   
*right 1 up 2*

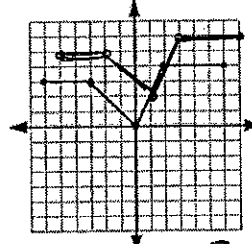
26)  $f(x + 2) - 1$   
*left 2 down 1*



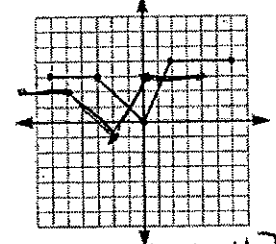
Domain:  $[-6, 6]$   
Range:  $[-5, -1]$



Domain:  $[-7, 5]$   
Range:  $[0, 4]$



Domain:  $[-5, 7]$   
Range:  $[2, 6]$



Domain:  $[-8, 4]$   
Range:  $[-1, 3]$