

Unit 2 – Part B Review

Activity 9: Rate of Change

Activity 10: Linear Models, Variation

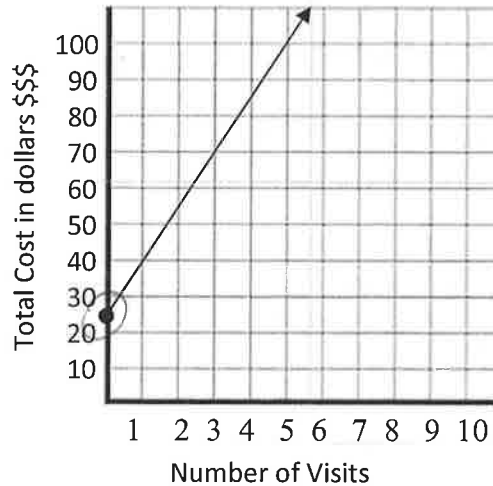
Activity 13: Equations from Data, Regressions

Activity 11: Arithmetic Sequences

Activity 12: Forms of Linear Functions

1. John's favorite hobby is paintballing. John pays an entry fee and an additional cost for paintballs. This graph represents the charges where x is the number of times he goes paintballing and y is the total cost. How much is the entry fee?

Paintballing Cost



$\approx \$25$

2. State the slope of the line that passes through the following points

a. $(-1, 0)$ and $(3, -8)$

b. $(3, 8)$ and $(3, 4)$

c. $(-2, 1)$ and $(4, 1)$

d. $(6, -5)$ and $(-2, 1)$

$$\frac{-8 - 0}{3 - (-1)} = \frac{-8}{4} = -2$$

$$\frac{4 - 8}{3 - 3} = \frac{-4}{0}$$

$$\frac{1 - 1}{4 - (-2)} = \frac{0}{6} = 0$$

$$\frac{1 - (-5)}{-2 - 6} = \frac{6}{-8} = -\frac{3}{4}$$

$m = -2$

Undefined

$m = 0$

$m = -\frac{3}{4}$

3. Which tables represent functions that are **not** linear? Select all that apply. If they are state the slope of the linear function.

Table 1

x	y
-1	.5
0	1
1	2
2	4

No

Table 2

x	y
-1	0
0	1
1	2
2	9

No

Table 3

x	y
-1	2
0	3
1	4
2	5

Yes

$m = 1$

Table 4

x	y
0	0
4	2
9	3
16	4

No

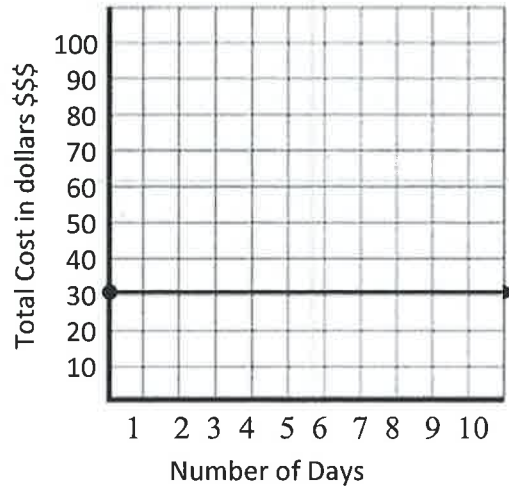
Table 5

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

No

4. The graph shows the price of entering Raging Waves Water Park for the current season as a function of the number of days since the tickets went on sale. What is the slope of the line and describe its meaning in this context. Also state the y-intercept and the meaning in context.

Raging Waves Ticket Cost



$m = 0$

The price has not changed
since going on sale

y-int: 30

At the start of the sale,
the price of tickets
are \$30.

5. Kerry works a part time job. His income vary directly with the number of hours he works. One day Kerry made \$72 for working 6 hours. Another day he earned \$48 for working only 4 hours. Which is an equation relating Kerry's income y , to the number of hours he worked x .

$y = kx$

$k = \frac{y}{x}$

$k = \frac{72}{6}$

$k = 12$

a. $y = 10x$

c. $y = 9x$

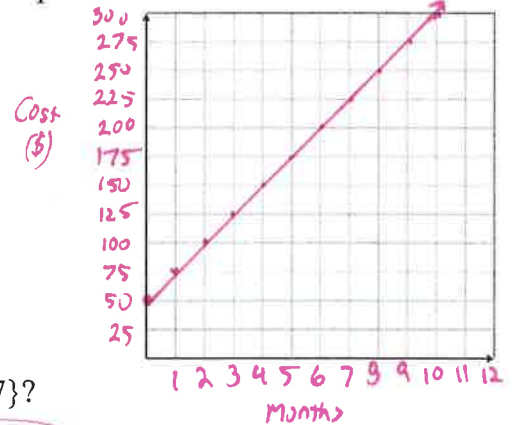
b. $y = 12x$

d. $y = 2x$

6. Paul's health club has an enrollment fee of \$50 and costs \$25 per month. Write an equation to model the situation, then graph the function. Then state the slope and what it means in context.

$y = 25x + 50$
or
 $f(m) = 25m + 50$

$m = 25$
Paul will pay \$25
for each month
of membership.



7. a. Which function model the sequence {7, 11, 15, 19, 23, 27}?

a. $f(a) = 4a$

b. $f(a) = 3a$

c. $f(a) = 4a + 3$

d. $f(a) = 3a + 4$

- b. State the arithmetic sequence in recursive form.

$a_1 = 7$ $d = +4$

$\left\{ \begin{array}{l} a_1 = 7 \\ a_n = a_{n-1} + 4 \end{array} \right.$

8. a. What are the first five terms in the arithmetic sequence with the recursive formula below?

$$a_1 = 2.5$$

$$a_n = a_{n-1} + 6$$

1	2	3	4	5
2.5	8.5	14.5	20.5	26.5

1	2	3	4	5
2.5	8.5	14.5	20.5	26.5

- b. Place the recursive form in simplified explicit form in function AND subscript notation.

$$a_n = 2.5 + 6(n-1)$$

$$2.5 + 6n - 6$$

$$a_n = 6n - 3.5 \rightarrow f(n) = 6n - 3.5$$

9. If $a_4 = 12$ and $a_9 = 27$:

- a. Write the explicit formula that models the arithmetic sequence.

$$\frac{27-12}{9-4} = \frac{15}{5} = 3$$

$$d=3$$

$$12 = a_1 + 3(4-1)$$

$$a_1 = 3$$

$$a_n = 3 + 3(n-1)$$

$$\begin{aligned} 12 &= a_1 + 9 \\ -9 & \quad -9 \\ \hline a_1 &= 3 \end{aligned}$$

$$a_n = 3n$$

- b. Write the recursive formula that models the arithmetic sequence.

$$a_1 = 3$$

$$d = 3$$

$$\begin{cases} a_1 = 3 \\ a_n = a_{n-1} + 3 \end{cases}$$

10. Write an equation, in slope-intercept form, that represents the relationship shown in this table.

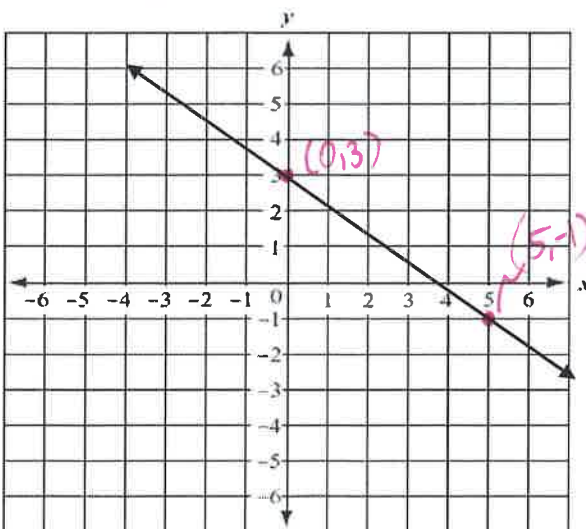
x	y
-2	0
0	-1
2	-2
4	-3

$$\text{Slope: } \frac{-1-0}{0-(-2)} = \frac{-1}{2}$$

$$y\text{-int: } -1$$

$$y = -\frac{1}{2}x - 1$$

11. Write the equation that represents the line shown on the graph in slope intercept, point slope AND standard form.



$$\text{Slope: } \frac{-1-3}{5-0} = -\frac{4}{5}$$

- a. Slope-Intercept: $y\text{-int: } 3$

$$y = -\frac{4}{5}x + 3$$

- b. Point-Slope: Slope: $-\frac{4}{5}$ Point: $(0, 3)$

$$y - y_1 = m(x - x_1)$$

$$y - 3 = -\frac{4}{5}(x - 0)$$

- c. Standard: If $y = -\frac{4}{5}x + 3$

$$+\frac{4}{5}x + \frac{4}{5}x$$

Can't have non-integers $\rightarrow \frac{4}{5}x + 1y = 3$

$$5(\frac{4}{5}x + 1y = 3)$$

$$\rightarrow 4x + 5y = 15$$

12. John plans to save \$50 from every pay check. After 6 pay checks, x , he has \$300 (y) in his savings account. Which equation, in standard form, represents this situation?

$$y - 300 = 50(x - 6)$$

$$y - 300 = 50x - 300$$

$$+300 \quad +300$$

$$y = 50x$$

$$-50x \quad -50x$$

a. $y - 300 = 50(x - 6)$

c. $50x + 300y = 6$

(6, 300) point
50 slope

b. $y - 6 = 50(x - 300)$

d. $50x - y = 0$

13. a. Write an equation, in slope intercept form, that is perpendicular to the line described by $y - 2 = 2x + 8$ and that contains the point $(-1, 12)$.

$$-50x + 1y = 0$$

Multiply by (-1)

$$50x - 1y = 0$$

$m = 2 \perp m = 1/2$

$$y - 12 = -1/2(x + 1)$$

$$y - 12 = -1/2x - 1/2$$

$$+12 \quad +12$$

$$y = -1/2x + 11 1/2$$

b. Write an equation, in slope intercept form, that is parallel to the line $y - 2 = 2x + 8$ and contains point $(-1, 12)$.

$$y - 12 = 2(x + 1)$$

$$y - 12 = 2x + 2$$

$$+12 \quad +12$$

$$y = 2x + 14$$

$m = 2 \parallel m = 2$

c. What is the relationship between the lines in part a and part b.

Line a - slope = $-1/2$
Line b - slope = 2

So... they are perpendicular because slopes are opposite reciprocals.

14. Write an equation of a line, in slope intercept form, that is parallel to the line containing the points $(0, -7)$ and $(5, 12)$.

$$\frac{12 - (-7)}{5 - 0} = \frac{19}{5}$$

~~scribble~~

$$m = 19/5 \parallel m = 19/5$$

$$y = \frac{19}{5}x + \underline{\hspace{2cm}}$$

any value other than ~~positive~~ negative 7.

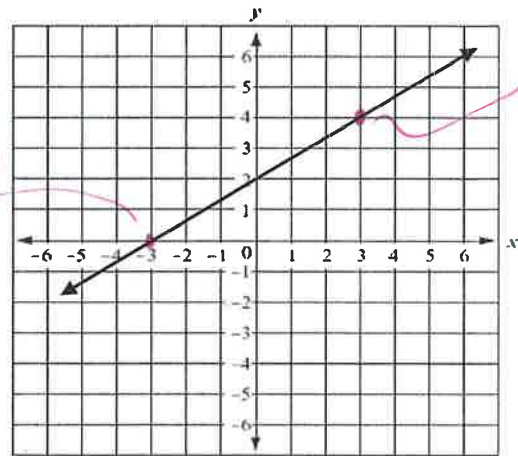
15. Write an equation of a line, in slope intercept form that is perpendicular to the line graphed below.

$$m = \frac{4 - 0}{3 - (-3)} = \frac{4}{6} = \frac{2}{3}$$

$$m = \frac{2}{3} \perp m = -\frac{3}{2}$$

$$y = -\frac{3}{2}x + \underline{\hspace{2cm}}$$

any y-intercept.
Multiple correct solutions



16. Use a calculator to perform a linear regression for these data points. Complete the equation of the line of best fit. Round values to the nearest hundredth.

$(3, 45), (3, 50), (1, 65), (6, 38), (6, 40), (6, 45), (2, 58)$

$$y = -4.14x + 64.7$$

