

December 10, 2018, Monday

★ Recall the slope formula has various form: $m = \frac{y_2 - y_1}{x_2 - x_1}$

★ The slope-intercept form of a line is: $y = mx + b$ and slope can be found by finding the m in the equation

Find the slope of the following:

- $(-19, 16), (-15, -4)$
 $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - 16}{-15 - (-19)} = \frac{-20}{-4} = 5$
- $(4, 0), (3, 1)$
 $m = \frac{1 - 0}{3 - 4} = \frac{1}{-1} = -1$
- $y = \frac{2}{3}x + 2$
 $m = \frac{2}{3}$
- $2x + y = -2$
 $2x + y = -2$
 $-2x - y = 2$
 $y = -2x - 2$
 $m = -2$

Dec 7-11:20 AM

Find the slope of the following:

- $(-19, 16), (-15, -4)$
 -5
-
- $y = \frac{2}{3}x + 2$
 $\frac{2}{3}$
-
- $2x + y = -2$
 A) 2 B) -2
 C) $-\frac{1}{2}$ D) $\frac{1}{2}$

Dec 10-7:51 AM

December 11, 2018 Tuesday

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

- A climber is on a hike. After 2 hours he is at an altitude of 400 feet. After 6 hours, he is at an altitude of 700 feet. What is the average rate of change?
 $ROC = \frac{700 - 400}{6 - 2} = \frac{300}{4} = 75$
- A scuba diver is 30 feet below the surface of the water 10 seconds after he entered the water and 100 feet below the surface after 40 seconds. What is the scuba divers rate of change?
 $ROC = \frac{100 - 30}{40 - 10} = \frac{70}{30} = \frac{7}{3}$
- Using the graph, what is the rate of change from week 0 to week 1?
 $\frac{400 - 300}{1 - 0} = 100$
- What is the ROC from week 6 to week 7?
 $\frac{1000 - 900}{7 - 6} = 100$
- Write the equation of the graph.
 $y = mx + b$
 $b = y\text{-intercept} = 300$
 $m = \text{slope} = ROC = 100$
 $y = 100x + 300$

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Dec 11-11:01 AM

December 12, 2018 Wednesday

- Which of the following statements are FALSE when identifying "Uphill", "Downhill", Horizontal, Vertical?
 A Positive slope increases from left to right.
 B Negative slope decreases from left to right.
 C Undefined slope is when there is no vertical change.
 D No or zero slope is a horizontal line.
 No correct answers
- How do you find the slope of a line?
 A Divide the difference of the y values by the differences of the x values.
 B Divide the difference of the x values by the differences of the y values.
 C Divide the rise of the line by the run of the line.
 D Both A and C.
 ordered
- Using the graph to the right, what is the rise and the run?
 $\frac{4}{-1} = -4$

Dec 7-11:23 AM

Foundations of Algebra Unit 4B - Characteristics of Linear Equations

Determine the characteristics of the following linear equations:

$y = 3x + 2$
 Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$
 x-intercept: $\frac{2}{3}$
 y-intercept: $(0, 2)$
 Increasing/Decreasing: Increasing

Write the equation of the following graph in slope-intercept form:

$y = mx + b$

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

Rate of Change:
 $m = \frac{y_2 - y_1}{x_2 - x_1}$
 $\frac{3 - 5}{-2 - 3} = \frac{-2}{-5} = \frac{2}{5}$

Use the table to find the rate of change between 2 and 5.

1	2	3	4	5	6
2	7	13	21	31	57
	x_1		x_2		

$\frac{39 - 7}{5 - 2} = \frac{32}{3}$

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Foundations of Algebra Unit 4B - Characteristics of Linear Test Review

7. For $f(x) = 2x + 5$, find the rate of change on the interval $[-2, 5]$.
 $m = \frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{f(5) - f(-2)}{5 - (-2)} = \frac{(2(5) + 5) - (2(-2) + 5)}{7} = \frac{15 - (-1)}{7} = \frac{16}{7}$

8. For $f(x) = 3x^2 + 7$, find the rate of change on the interval $[-7, 10]$.
 $m = \frac{f(10) - f(-7)}{10 - (-7)} = \frac{(3(10)^2 + 7) - (3(-7)^2 + 7)}{17} = \frac{307 - 148}{17} = \frac{159}{17}$

9. Find the average rate of change between $(-2, 10)$ and $(-1, 10)$.
 $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 10}{-1 - (-2)} = \frac{0}{1} = 0$

10. Two functions are represented below. Function A is represented by an equation and Function B is represented by the graph. Write an equation for Function B, then compare the rate of change and y-intercept of the two functions.
 Function A: $y = \frac{1}{2}x + 4$
 ROC = $\frac{1}{2}$, $b = 4$
 Function B: $y = \frac{3}{4}x + 3$
 ROC = $\frac{3}{4}$, $b = 3$
 Function B has a larger ROC. Function A has a larger y-intercept.

Dec 7-11:22 AM

December 13, 2018 Thursday

1) Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$
 x-intercept: $(-3, 0)$
 y-intercept: $(0, 3)$
 Increasing or Decreasing? Increasing

Write the equation of the following graphs in slope-intercept form.
 $y = m(x + b)$
 $b = 1$
 $m = \frac{1}{2}$
 $y = \frac{1}{2}x + 1$

3) For $f(x) = 2x^2 + 3x - 5$, find the rate of change on the interval $[4, 9]$.
 $m = \frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{(2(9)^2 + 3(9) - 5) - (2(4)^2 + 3(4) - 5)}{9 - 4} = \frac{181 - 39}{5} = \frac{142}{5}$

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What formulas do we need for today's test?

$y = mx + b$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$ $m = \frac{\text{rise}}{\text{run}}$

Dec 13-8:05 AM

December 14, 2018 Friday

6. Use the table to find the rate of change between 3 and 6.

1	2	3	4	5	6
13	21	39	57		

 $m = \frac{39 - 21}{6 - 3} = \frac{18}{3} = 6$

9. Find the average rate of change between $x_1 = -2$ and $x_2 = 0$.
 $m = \frac{4 - 1}{0 - (-2)} = \frac{3}{2}$

10. Two functions are represented below. Function A is represented by an equation and Function B is represented by the graph. Write an equation for Function B, then compare the rate of change and y-intercept of the two functions.
 Function A: $y = 3x - 4$
 $m = 3$, $b = -4$
 Function B:
 $m = \frac{0 - (-5)}{7.5 - 0} = \frac{5}{7.5} = \frac{2}{3}$
 $b = -5$
 The slope of Function A is bigger than Function B. Both y-intercepts are negative.

Dec 7-11:24 AM

Foundations of Algebra Final Exam Review Fall 2017

1. Rational Number: 4
 2. Irrational Number: $\pi = 3.14$

3. Identify the opposite of the following numbers:
 $14 \rightarrow -14$, $4.7 \rightarrow -4.7$, $-3.2 \rightarrow 3.2$, $-\frac{3}{4} \rightarrow \frac{3}{4}$

4. Identify the absolute value of the following numbers:
 $|3| = 3$, $|-0.52| = 0.52$, $|-4.5| = 4.5$, $|-81| = 81$

5. Simplify the following radicals:
 $\sqrt{15} = \sqrt{3 \cdot 5} = \sqrt{3} \sqrt{5}$
 $\sqrt{120} = \sqrt{4 \cdot 3 \cdot 5} = 2\sqrt{3 \cdot 5} = 2\sqrt{15}$
 $\sqrt{63} = \sqrt{9 \cdot 7} = 3\sqrt{7}$

Use the Pythagorean Theorem to find the missing side of the right triangle. $a^2 + b^2 = c^2$

6. $a = 5, b = 12, c = ?$
 $5^2 + 12^2 = c^2$
 $25 + 144 = c^2$
 $169 = c^2$
 $13 = c$

7. The diagonal brace on a gate is 4 feet long. The height of the gate is 3 feet. How wide is the gate?
 $3^2 + x^2 = 4^2$
 $9 + x^2 = 16$
 $x^2 = 7$
 $x = \sqrt{7}$

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Foundations of Algebra Final Exam Review Fall 2017

8.9. Solve the following Literal Equations for "y" using the Do-Undo method.
 $2x + y = 9$
 $3x - 4y = 16$

10.13. Solve the following linear equations.
 $x + 10 = 24$
 $3x - 12 = 24$
 $\frac{x}{5} - 8 = -4$
 $6x - 12 = 4x + 22$

14. Solve the following inequality and graph the solution on a number line.
 $2x + 12 < 36$

15. Translate the following to a verbal expression:
 Three more than 2 times a number "m" is 24.
 $3x^2 + 6x - 9$

Leading Coefficient: _____ Number of Terms: _____ Degree: _____
 Constant: _____ Name by number of terms: _____ Name by degree: _____

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Foundations of Algebra Final Exam Review Fall 2017

17. Two consecutive numbers have a sum of 97. What are the numbers?

18. Convert: 4.5 meters = _____ cm

19. Convert: 11.25 d = _____ wk

21-23. Simplify the following fractions:

$\frac{2}{3} \cdot \frac{7}{4}$	$\frac{3}{4} \cdot \frac{1}{8}$
$\frac{3}{5} \cdot \frac{2}{7}$	$\frac{2}{9} \cdot \frac{3}{8}$

24. Convert the following to slope-intercept form of a line
 $2x - 4y = -16$

25. Identify the slope and y-intercept of the equation above.
 m= _____ b= _____

26. Is the following a function? Explain your reasoning.

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Foundations of Algebra Final Exam Review Fall 2017

27-28. Use the following function:
 $f(x) = -3x^2 + 16x - 24$

27. $f(2) =$ _____ 28. $f(-5) =$ _____

Use the following sequence for 29-33: 12, 14, 16, 18, 20, ...

29. What are the next 3 terms in the sequence? _____, _____, _____

30. What is the common difference? $d =$ _____

31. What is the zero term? $a_0 =$ _____

32. What is the explicit formula? _____

33. Find $a_{11} =$ _____

34. Find $a_{20} =$ _____

Find the rate of change for 35-36.

(3,12), (-4,7)	(21,-12), (-8,-6)
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