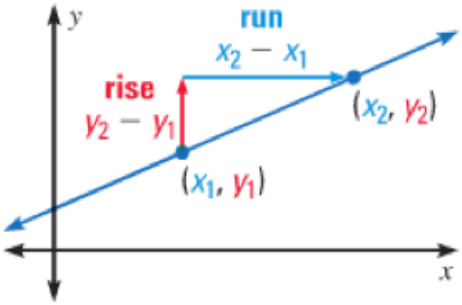
NAME:_____

2.3 Find Slope and Rate of Change

Slope:



m =

Find the slope for each , then tell if it rises, falls, is horizontal or is vertical:

Ex 1:

Ex 2:

Ex 3:

Ex 4:

Parallel Lines:

Perpendicular Lines:

Ex 5:

Ex 6:

Rate Of Change:

Ex 7:

Ex 8: A car uses 3 gallons of gas for 50 miles on one trip and uses 9 gallons of gas for 140 miles on another trip. What's the average rate of change in miles per gallon?

You try:

1) Tell whether the slopes are parallel, perpendicular or neither.
Line 1: through (4.5, 3.2) and (-2.5, 0.2).
Line 2: through (3, 3) and (10, 0)

2) After 2 months a bamboo plant was 1.75 inches tall. After 8 months the same plant was 12.4 inches tall. Find the rate of change in terms of inches per month. Predict how tall it will be after one year.

SUMMARIZE YOUR NOTES:

2.3 Practice Problems

Directions: Find the slope of the line passing through the given points. Then tell whether the line rises, falls, is horizontal or is vertical.		
1) (2, -4), (4, -1)	2) (-3, -2), (3, -2)	3) (-1, 4), (1, -4)
4) (5, 5), (7, 3)	5) (4, 4), (4, 9)	6) (8,9), (-4, 3)

7) (-4.2, 0.1), (-3.2, 0.1)	8) $(-\frac{1}{2}, \frac{5}{2})$, $(\frac{5}{2}, 3)$	9) $(\frac{7}{3}, \frac{4}{5})$, $(\frac{7}{3}, \frac{9}{5})$

Directions: Describe and correct the error in finding the slope of the line passing through the given points.

10)

$$(-4, -3), (2, -1)$$

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

11)

$$(-1, 4), (5, 1)$$

$$m = \frac{5 - (-1)}{1 - 4} = -2$$

Directions: Tell whether the lines are parallel, perpendicular or neither.

12) Line 1: Through (3, -1) and (6, -4)
Line 2: Through (-4, 5) and (-2, 7)

13) Line 1: Through (-3, 2) and (5, 0)
Line 2: Through (-1, -4) and (3, -3)

14) Line 1: Through (-1, 4) and (2, 5)
Line 2: Through (-6, 2) and (0, 4)

Directions: Find the average rate of change for each situation.

15) Red Cross raises $250 after 2 hours and $785 after 6 hours. What's the average rate of change in terms of dollars per hour?

16) At the beginning of practice the football team has a 10 liter jug of water. After 30 minutes there are 3 liters left. What's the average rate of change in terms of liters per minute?

17) Mr. Brust goes to the mall with $200 in his wallet and after 20 minutes he has $40 left in his wallet. What's the average rate of change in terms of dollars per minute spending?

18) In one hour RHS has raised $40 for prom, and after 8 hours RHS has still only raised $40 for prom. What's the average rate of change in terms of dollars per hour fundraising?

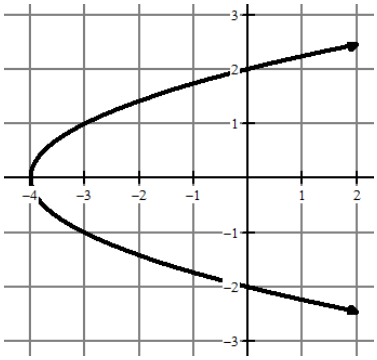
Algebra Skillz

1) Find the y-interecept(s)

2) Find the x-intercept(s)

3) Find f(-3) =

4) Find x when f(x) = 1



5) Simplify: $10\sqrt{70}$

6) Simplify: $-3\sqrt{48}$

7) Solve: $\frac{40}{x+2} - 15 = -7$

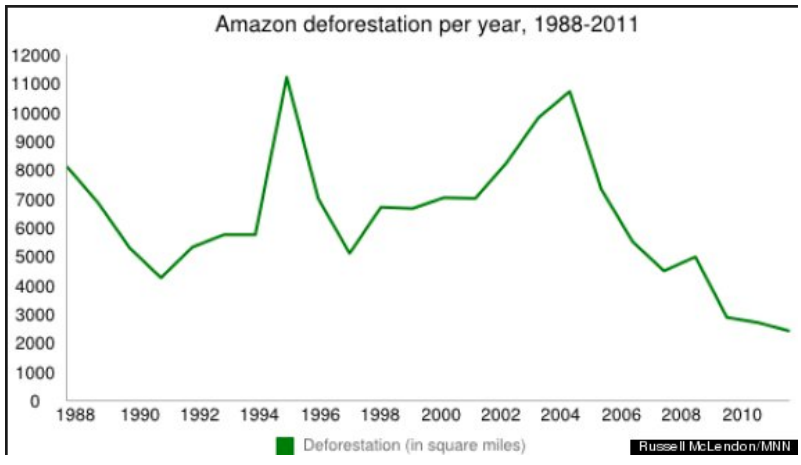
8) Factor: $4x^5 + 18x^3$

2.3 Application and Extensions

1) Find the slope and tell if it rises, falls, is vertical or is horizontal: (-3, 6), (9, 0).

2) Kelly has 3 new students after 1 day and 16 new students after 5 days. What's the average rate of change for new students per day?

3) 20% of the world's oxygen is produced by the Amazon Rain Forest by recycling the carbon dioxide into oxygen. Nearly half of the world's species of plants, animals and microorganisms will be destroyed by rainforest deforestation in the next 25 years. The chart below shows the deforestation in terms of square miles for each year.



a) What's the average rate of change from the start of this graph (8000 sqm) to the end (2500 sqm)?

b) Using the graph, between what two years did the biggest average rate of change occur? How do you know?

c) The major trend of falling rate of change in deforestation started in 2004. What's the average rate of change between 2004 and 2011. (Use the graph and estimate sqm for each year).

4) Bean, Brust and Kelly LOVE to go skiing together. They know that the steeper a run is, the more fun they'll have chasing each other down the slopes. They each set out one winter to find the most fun run they could.

a) Bean found a great slope in the German Alps. Its vertical change was 1234 meters and its horizontal change was 712 meters. What is the slope of Bean's slope?

b) Brust found what he thought was clearly the best slope in Europe in Austria. Being the nerd he quite often is, he found the coordinates of the end of the run to be (0 feet, 1250 meters). Yep this one started halfway up the mountain. The coordinates for the start of the run were (548 meters, 2237 meters). What's the slope of Brust's run?

c) Kelly, as unconventional as he is, found his favorite run to be in…Bosnia. Always off the beaten path Kelly determined knew that his run was 3504 meters high. The staff also told him that ski run itself was 4065 meters long. What was the slope of Kelly's slope? (Hint: Use the length of the run as the hypotenuse of right triangle to find the horizontal change using Pythagorean theorem).

d) Who's run would the guys enjoy skiing together the most if the want to find the steepest slope?

SAT PREP Below are sample SAT questions. The SAT is the main standardized test that colleges look at for admission. One is multiple choices; the other is free response where you must grid in your answer. Blow it up.

MULITPLE CHOICE

For which value of the following functions is $f(-2) < f(2)$?

(A) $f(x) = 2x^2$
(B) $f(x) = 2$
(C) $f(x) = \frac{2}{x}$
(D) $f(x) = 2 - x^3$
(E) $f(x) = x^4 + 2$

GRID IN

If $f(x) = -x^2 + 14$, what is the value of $f(-3)$?