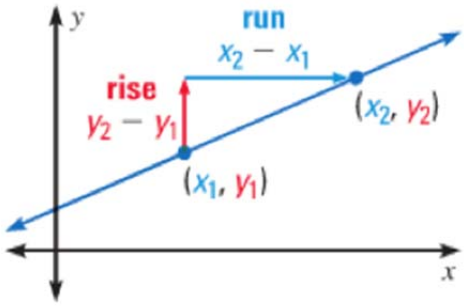
NAME:_____

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:

<u>Parallel Lines:</u>

<u>Perpendicular Lines:</u>

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?

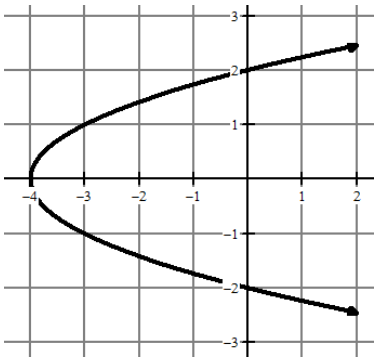
Algebra Skillz

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?

SAMPLE RESPONSES TO RICH TASK: COMBINING INEQUALITIES

First Student Response: SAOIRSE

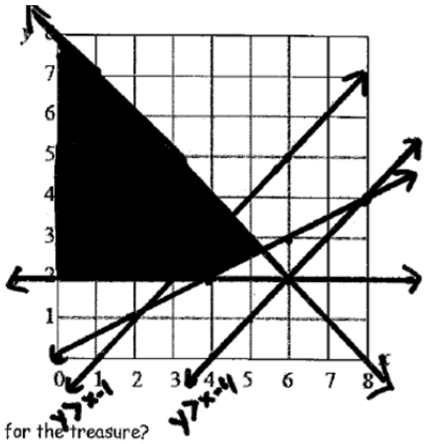
What mistake or mistakes did Saoirse make in her graph? Does that affect her answers to which possible points the treasure could be located at? Explain using complete sentences.

Some treasure has been buried at point (x, y) on the grid, where x and y are whole numbers. Here are three clues to help you find the treasure.

Clue 1: $x > 2$
Clue 2: $x + y < 8$
Clue 3: $2y - x \geq 0$

$x+y<8$
$y<-x+8$

$2y-x\geq 0$
$2y \geq x$
$y \geq \frac{1}{2}x$



1) Which of the following points could be a possible location for the treasure?

(3, 2) (2, 3) (5, 3) (3, 5) (4, 3) (5, 2)

Is Saoirse answer correct according to the given clues? Defend your answer. Is her answer right according to her graph? Defend your answer.

Which of those two extra clues doesn't help at all?

Explain why. CLUE 5 DOESN'T HELP AT ALL BECAUSE ALL OF THE PREVIOUSLY SHADED REGION WAS ALREADY GREATER THAN x-4.

At what point is the treasure located? Defend your answer.

THE TREASURE IS LOCATED AT POINT (2,4). THIS POINT SATISFIES ALL THE POSSIBLE CLUES GIVEN.

Second Student Response: DECLAN

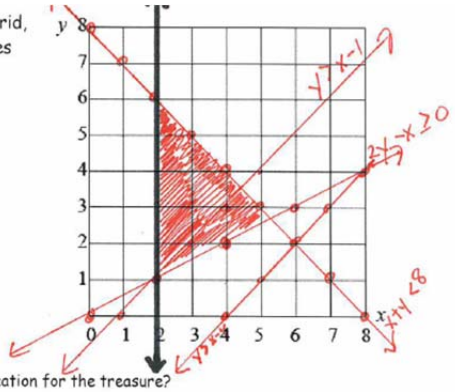
What about Declan's graph bothers you? Why? How would you fix it?

Some treasure has been buried at point (x, y) on the grid, where x and y are whole numbers. Here are three clues to help you find the treasure.

Clue 1: $x > 2$
Clue 2: $x + y < 8$
Clue 3: $2y - x \geq 0$

$x+y<8$
$-x \quad -x$
$y<8-x$

$+x \quad +x$
$\frac{2y}{2} \geq \frac{x}{2}$
$y \geq \frac{1}{2}x$



1) Which of the following points could be a possible location for the treasure?

(3, 2) (2, 3) (5, 3) (3, 5) (4, 3) (5, 2)

2) On the grid show all possible places the treasure could be located.

Why is Declan's answer wrong? What did he not consider? What's the right answer?

At what point is the treasure located? Defend your answer.

I believe the treasure is located at point (4,3) because it is in the shaded area. This means that it satisfies all of the clues that were given.

It's your turn to bury your own treasure. Consider the following parameters in order to bury your treasure.

1) Come up with FOUR INEQUALITY CLUES.
2) At LEAST two of the clues must be absolute value inequalities.
3) You can only have one vertical or horizontal clue.
4) You can only use a slope of 1 in one of your clues.
5) You must bury your treasure at the point (5, 4)

CLUE 1:

CLUE 2:

CLUE 3:

CLUE 4:

Graph your clues to prove you've buried your treasure in the right spot!