8.F.2 Compare properties of two functions each represented in a different way.

Mattie created two functions. $m=\frac{4}{2}=2$

For Function A, the value of y is two less than four times the value of x. The table to the right represents Function B. $y=4x-2$

Function B

x	y
−3	−9
−1	−5
1	−1
3	3

(+2, +4)

In comparing the rates of change, which statement is true?

a) Function A and Function B have the same rate of change.
b) Function A has a greater rate of change than Function B has.
c) Function A and Function B both have negative rates of change.
d) Function A has a negative rate of change and Function B has a positive rate of change.

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Salary Plan 1

$y = 7x + 100$

Salary Plan 2

x	y
10	152
20	252
30	352
40	452

(+10, +100)

John was given a choice between two weekly salary plans. He plans to work for one year. What information should he use to choose?

a) He chose Plan 1 because of the $100.
b) He chose Plan 2 because of the $152.
c) He chose Plan 1 because of the $7.
d) He chose Plan 2 because of the $100/10.

Michelle planted two plants. After each plant had grown a little, she began using them for a science experiment.

$m=\frac{2}{1}=2$

Plant 1:

Number of Days (x)	0	1	2	3	4
Height in cm (y)	1.5	3.5	5.5	7.5	9.5

(+1, +2)

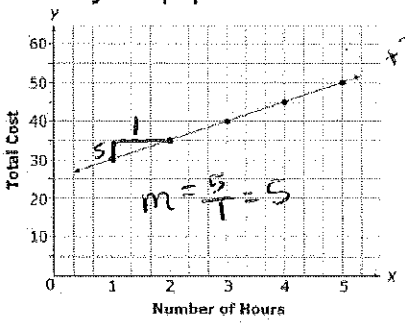
Plant 2:

The equation $y = 3 + 1.5x$ represents y, the height in centimeters, of Plant 2 over x days. $m = 1.5$

The correct rates of change for Plant 1 and 2 are?

a) Plant 1 is 1.5 ; Plant 2 is 1.5
b) Plant 1 is 1.0 ; Plant 2 is 3
c) Plant 1 is 1.5 ; Plant 2 is 3
d) Plant 1 is 2.0 ; Plant 2 is 1.5

Kelly's Equipment Rental



Wendy's Watersports

Hours	Cost
2	$35
5	$65
7	$85

(+3, +30)

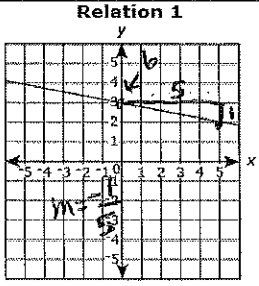
$m=\frac{30}{3}=10$

The FFA leader was trying to decide which kayak rental was a better deal, which is correct?

a) Wendy's charges $10 less per hour.
b) Kelly's charges $10 less per hour.
c) Wendy's charges $5 less per hour.
d) Kelly's charges $5 less per hour.

Two relations are given in different formats.
Use these relations to answer the questions.

Relation 1



Relation 2

m	t
−3	10
−2	5
−1	2
0	1
1	2
2	5
3	10

(+1, −5) (+1, −3)

Part A: Determine whether or not each relation represents a function. Justify your answers.

Both relations are functions, because each has x being paired with only one y.

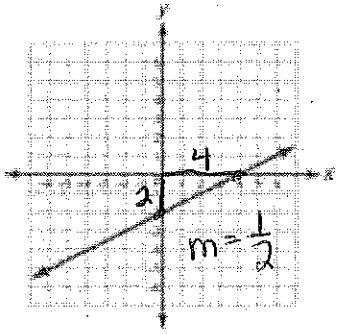
Part B: Determine whether each function identified in Part A is linear or nonlinear. Explain how you know.

Relation 1 is linear, because it shows a straight line on the graph, but Relation 2 is nonlinear because it doesn't have a constant rate of change.

Part C: Write an equation for each linear function identified in Part B. Explain what each part of your equation(s) represents. $y=-\frac{1}{5}x+3$ $-\frac{1}{5}$ is the rate of change and 3 is the y-intercept.

8.F.2 Compare properties of two functions each represented in a different way.

The table and graph below represent two functions.



Function B	
x	y
-5	1.75
-2	2.5
0	3
4	4
10	5.5

+4 → +1

$m = \frac{1}{4}$

Which of the following statements is true?

A. The rate of change for Function A is twice the rate of change for Function B.
B. The rate of change for Function A is four times the rate of change for Function B.
C. The rate of change for Function B is twice the rate of change for Function A.
D. The rate of change for Function B is one-tenth the rate of change for Function A.

Mr. Carter asked his class to compare rates of change for the functions shown below.

Function A	
x	y
-6	$-1\frac{3}{5}$
-4	$-\frac{2}{5}$
0	2
2	$3\frac{1}{5}$
9	$7\frac{2}{5}$

+2 → +1 1/5

Function B

$y = \frac{5}{8}x + 6$

$m = \frac{5}{8} = 0.625$

$m = \frac{1\frac{1}{5}}{2} = \frac{\frac{6}{5}}{\frac{2}{1}} = \frac{6}{5} \cdot \frac{1}{2} = \frac{6}{10} = \frac{3}{5} = 0.6$

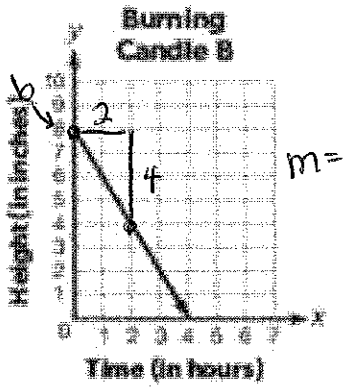
Which of the following is true?

A. The rate of change for Function A is greater than the rate of change for Function B.
B. The rate of change for Function B is three times greater than the rate of change for Function A.
C. The rate of change for Function B is greater than the rate of change for Function A.
D. The rate of change for both functions is equal.

Adam lights two candles, each a different height, at the same time and keeps track of how their heights change as they burn. The height of candle A, in inches, after it has burned x hours, is described by the equation y = 9-1.5h. The height of candle B, in inches, after it has burned for x hours, is shown by the graph below.

b = 9

m = -1.5



$m = \frac{-4}{2} = -2$

Part A: Which candle was taller before it was lit? Explain how you know.

Candle A was taller. It was 9 inches when it was lit and Candle B was 8 inches.

Part B. Which candle is burning at a faster rate? Justify using mathematical language.

Candle B is burning faster. It's burning 2 inches per hour, and Candle A is burning 1.5 inches per hour.

Part C: Explain how you used the equation and the graph to determine your answers.

The 9 in the equation was Candle A's height, and the graph for Candle B showed 8 as the beginning height. The rate of change in the equation was Candle A's burning rate, and the slope from the graph was Candle B's.