Name: **Key**

MODULE 2 TOPIC 1 REVIEW

1: Are each of the following graphs linear and/or proportional?
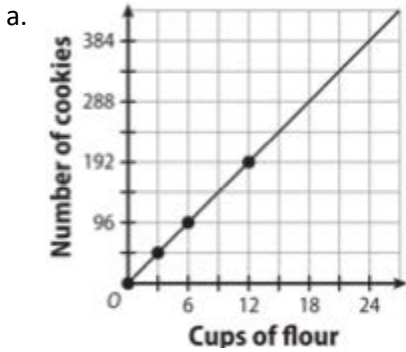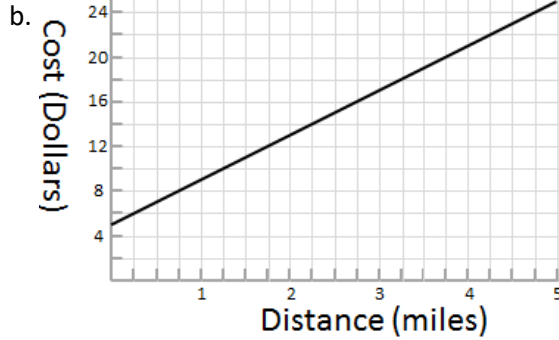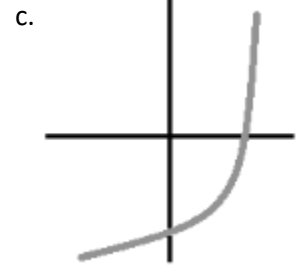
a.

Number of cookies (y-axis: 96, 192, 288, 384)
Cups of flour (x-axis: 6, 12, 18, 24)

- Linear or Non-Linear?

-Proportional or non-proportional?

b.

Cost (Dollars) (y-axis: 4, 8, 12, 16, 20, 24)
Distance (miles) (x-axis: 1, 2, 3, 4, 5)
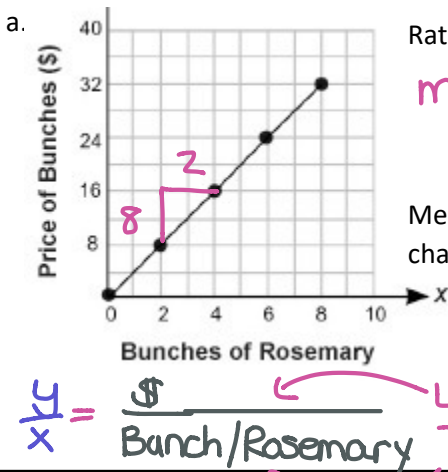
- Linear or Non-Linear?

-Proportional or non-proportional?

c.

- Linear or Non-Linear?

-Proportional or non-proportional?

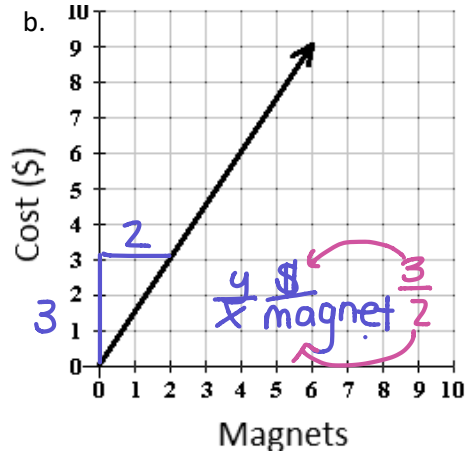**2. What is the rate of change of each graph? What does it mean in context of the situation?**

a.

Price of Bunches ($) (y-axis: 8, 16, 24, 32, 40)
Bunches of Rosemary (x-axis: 2, 4, 6, 8, 10)

$\frac{y}{x} = \frac{\$}{Bunch/Rosemary} = \frac{4}{1}$

Rate of change:

$m = \frac{8}{2} = \boxed{4}$

Meaning of the rate of change:

$4 / bunch of rosemary

b.

Cost ($) (y-axis: 0–10)
Magnets (x-axis: 0 1 2 3 4 5 6 7 8 9 10)

$\frac{y}{x} \frac{\$}{magnet} \frac{3}{2}$

Rate of change:

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

Meaning of the rate of change:

$3/2 magnets
or
$1.50/magnet

3. a. Explain why the graph in question 1, part a is proportional:

Line goes through (0,0)

b. Explain why the graph in question 1, part b is not proportional:

Line doesn't go through (0,0)

c. Explain why the graph in question 1, part c is not proportional:

proportional relationships are linear & go through (0,0)

4. Are each of the following equations proportional or non-proportional?

a. $y = 3x - 4$ b $y = -2x + 6$.   c. $y = \frac{7}{8}x + 8$ d. $y = \frac{5}{6}x$ e. $y = -4x$

Non-proportional   Non-proportional   Non-proportional   proportional   proportional

5. Write an equation of the line in the graph.
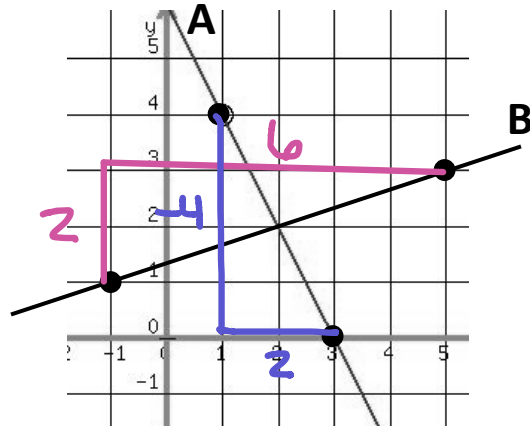
y = _y = 10x_

Cost of Electricity

6
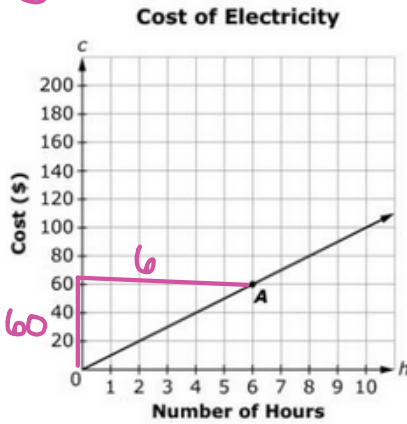
m = $\frac{60}{6}$ = 10

6. Find slope of each line. Be sure to simplify.

Line A: m = $\frac{-4}{2}$ = -2   Line B: m = $\frac{2}{6}$ = $\frac{1}{3}$

2   -4   6

7. Define each of the following…

Linear: Straight line

Proportional relationship: one variable is always constant value times the other.

Rate of Change: $\frac{y}{x}$ how one quantity changes in relation to another.

8. Rank the following rates of change from least to greatest.

a. $y = 3x$

b. $y = 7x$

c. $y = 0.9x$

d. $y = 0.2x$

D, C, A, B

9. Bill, Kevin, and Nicole took their families on the same vacation, but traveled in separate cars. Their speeds are expressed below. Find the constant of proportionality for each, then rank them in order from fastest to slowest.
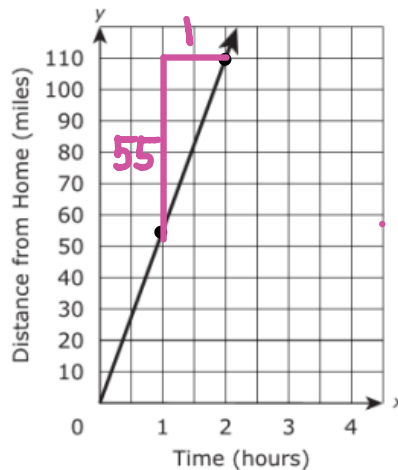
Nicole, Bill, Kevin

$k =$ 55   **Bill's Trip**

55   1

$k =$ 45

Kevin's Trip

Time (hours)	Distance from Home (miles)
0	0
2	90
3	135
5	225
6	270

$\frac{90}{2} = 45$

$\frac{135}{3} = 45$

$k =$ 60

Nicole's Trip

$y = 60x$

$\frac{225}{5} = 45$

$\frac{270}{6} = 45$

10. Mrs. Rippe was analyzing how much better the Dodgers are than the Giants.

She noticed that the Dodgers won 5 out of every 7 games that they played against them.

a. If the Dodgers won 40 games against the Giants, how many games were played between the two teams?

$\frac{Win}{total}$ $\frac{5}{7} = \frac{40}{x}$ $\frac{5x}{5} = \frac{280}{5}$
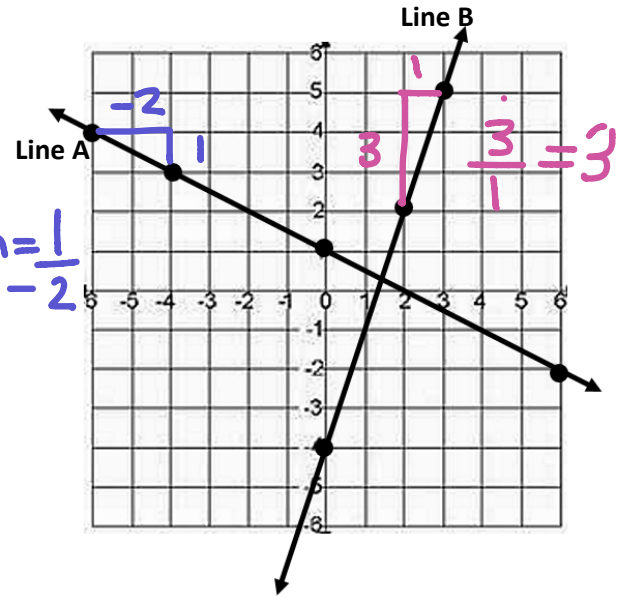
X = 56 total games

b. If the Dodgers and Giants have played 112 games against each other, how many have the Dodgers won?

$\frac{Win}{total}$ $\frac{5}{7} = \frac{x}{112}$ $\frac{7x}{7} = \frac{560}{7}$

X = 80

11. Which of the following represents the slope when using the idea of similar triangles? (circle all that apply)

THINK ABOUT WHICH ONES YOU CAN ELIMINATE IMMEDIATELY BASED ON IF THE LINE IS POSITIVE OR NEGATIVE

Line A:
a. $-\dfrac{3}{6}$ b. $\dfrac{1}{2}$ c. $-\dfrac{2}{1}$ d. $\dfrac{2}{4}$

e. $\dfrac{5}{10}$ f. $-\dfrac{4}{2}$ g. $-\dfrac{1}{2}$ h. $-\dfrac{5}{10}$

i. $\dfrac{3}{6}$ j. $\dfrac{2}{1}$ k. $-\dfrac{2}{4}$

Line B: a. $-\dfrac{1}{3}$ b. $\dfrac{1}{3}$ c. $-\dfrac{3}{1}$ d. $\dfrac{3}{1}$

e. $\dfrac{6}{2}$ f. $-\dfrac{6}{2}$ g. $\dfrac{9}{3}$ h. $\dfrac{9}{3}$

-2 $m = \dfrac{1}{-2}$

Line A

Line B

3 $\dfrac{3}{1} = 3$

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12. Answer the following questions.

a. What are the requirements for a relationship to be PROPORTIONAL?

Linear, constant rate, go through (0,0), y=kx form

b. What are some reasons a relationship could be NON-PROPORTIONAL?

Non-Linear, not in y=kx, doesn't go through (0,0)

c. Are all linear relationships proportional? Why or why not?

yes

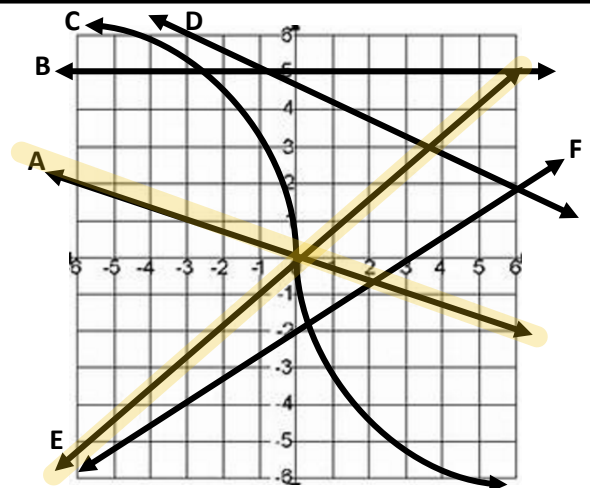d. If a line goes through the y-intercept (0, 5), can it be proportional?

no

e. If a line has the form of the equation, y = kx, is the relationship proportional or non-proportional?

proportional

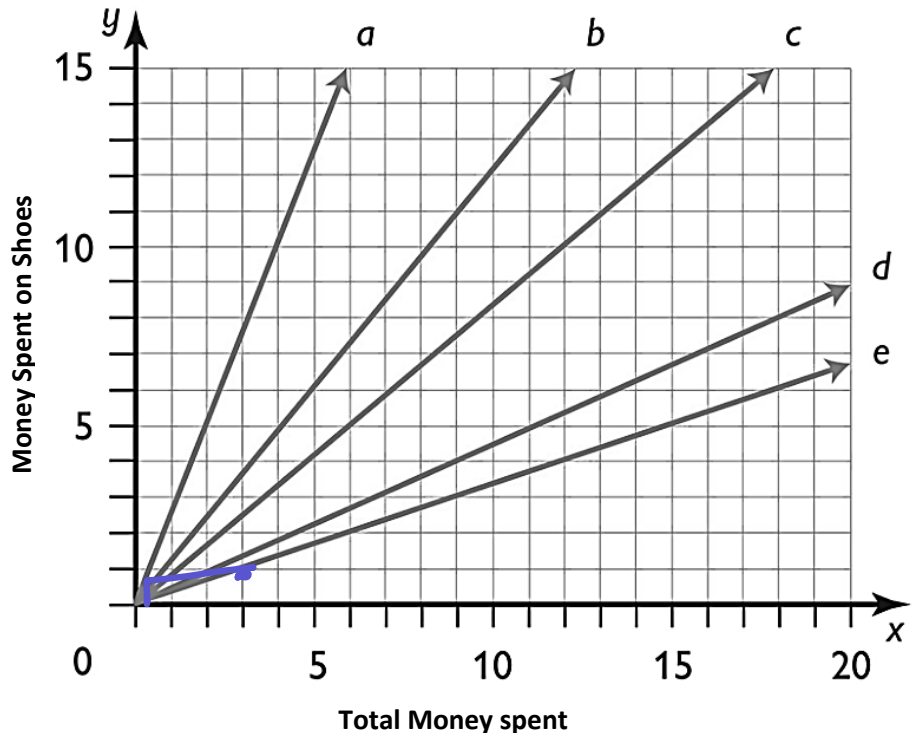**13. Which of the provided lines are proportional?**

Lines A & E

C   D

B

A

F

E

14. John is going to the mall to buy new clothes. 3 out of every 9 dollars he spends is spent on shoes. Which line represents this problem situation?

$$\frac{y}{x} \quad \frac{3}{9} = \frac{1}{3}$$

Line E

Money Spent on Shoes (y-axis) vs Total Money spent (x-axis). Lines a, b, c, d, e.

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15. Five people were polled about how much money they make for working a certain amount of minutes.

a. Which two students made the same amount per minute?

Easton & Alicia

b. Which person earned money at a rate of $6 every 8 minutes?

$$\frac{\$6}{8} = \frac{3}{4} \quad \text{Jimmy}$$

Person	# of minutes worked	Money Earned	Money earned per minute
Mike	100	$50	$\frac{50}{100} = \frac{1}{2} \to \$.50/min$
Jimmy	240	$180	$\frac{180}{240} = \frac{3}{4} \to \$.75/min$
Alicia	80	$64	$\frac{64}{80} = \frac{4}{5} \to \$.80/min$
Brooklyn	50	$20	$\frac{20}{50} = \frac{2}{5} \to \$.40/min$
Easton	60	$48	$\frac{48}{60} = \frac{4}{5} \quad \$.80/min$

c. Suppose a person gets a job that pays the same rate as Brooklyn. This person works for 160 minutes. How much money would he earn?

$$\frac{\$}{min} \quad \frac{2}{5} = \frac{x}{160} \qquad \frac{5x}{5} = \frac{320}{5} \qquad \boxed{x = \$64}$$

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16. The Penningtons and the Williams family went on a road trip. The Penningtons traveled at a rate of 80 miles per hour. The Williams traveled at a rate of 60 miles per hour. Which line represents which family?

Pennington Family: Line ___y___

Williams Family: Line ___x___

Comparing Road Trips. Distance (miles) vs Time (hours). Lines y and x.