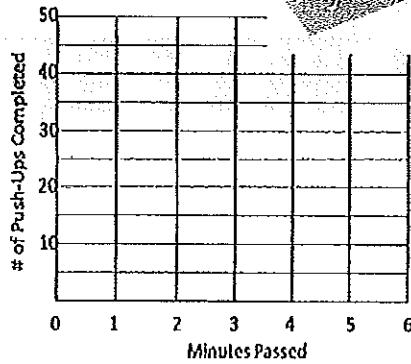Name _____ Date _____ Class_____

Ms. Moulder, Mr. Washington, Mr. Stewart, and Ms. Bolden were training for a push-up contest. They recorded the number of push-ups they could do per minute in the tables below. Graph their data on the provided graph, then answer the questions below.
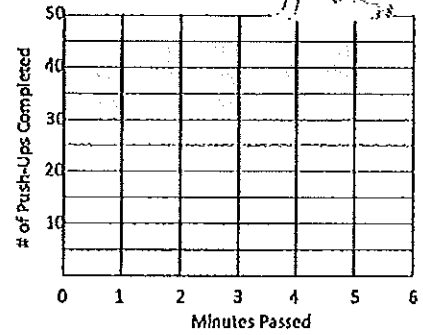
Ms. Moulder

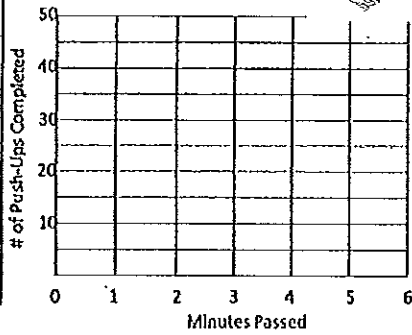| Mins.	Push-Ups
1	7
2	14
3	21
4	28
5	35

Mr. Washington

Mins.	Push-Ups
1	12
2	17
3	24
4	28
5	37

Mr. Stewart

Mins	Push-Ups
1	8
2	16
3	24
4	32
5	40

Ms. Bolden

Mins	Push-Ups
1	8
2	19
3	25
4	29
5	34
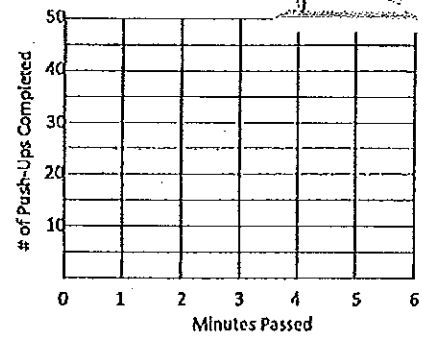
1.) Predict the number of push-ups each teacher will do in 6 minutes, and plot that point on their graph. Which predictions do you feel most confident about? Explain:

2.) If the push-up contest is 12 minutes long, how many push-ups do you think each teacher will complete? Explain how you made your predictions.
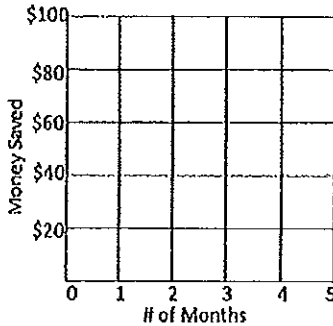
①

3) **1.** You and your friend decide to have a competition to see who can save the most money for college. You open a new account and then plan to deposit $20 every month.

A) Write an equation for the amount of money, y, after x months:

_____

B) Complete the table of values:

# of Months	Amount of $
0	0
1	20
2	
3	60
4	

C) Make a graph:

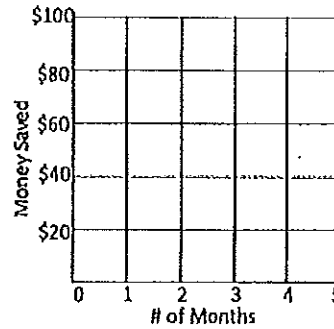D) This relationship is a proportional relationship. Why do you think that is?

4) **2.** Your friend already has $50 saved in an account, and he decides to add another $10 each month.

A) Write an equation for the amount of money, y, after x months:

_____

B) Complete the table of values:

# of Months	Amount of $
0	50
1	60
2	
3	
4	90

C) Make a graph:

D) This relationship is a non- proportional relationship. Why do you think that is?

Proportional Relationships, and Direct Variation:

5) - Proportional relationships_____ . _____ at a _____rate, and are therefore, more predictable than a relationship that is not proportional.

6) - If a relationship is proportional, x and y will both equal _____at the same time.

- Another way to say that a relationship is proportional is to say that it is in direct variation.

- When two variables are related in such a way that the ratio of their values always remains the same, the two variables are said to be in _____

For example:

Hours Worked	0	1	2 ,	3
$ earned	$0	$5.00	$10.00	$15.00

This is a proportional relationship,. I know this because an additional $5 is earned for every 1 hour worked, and at 0 hours, $0 was earned.

Constant of Proportionality:

7) The constant of proportionality is another term for the _____ _____, and it tells us the amount that your y-value changes by for every 1 unit that your ____-_____ changes.

8) I. The table below shows the number of pages read by a student compared to the amount of time that has passed. Use the table to answer questions a-c.

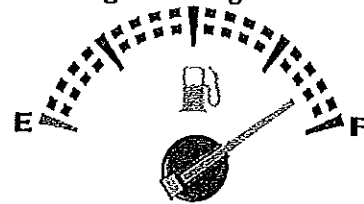| Hours Passed	2	4	6	8
Pages Read	148	296	444	592

a. Pick two ordered pairs on the table, and test to see if they are proportional.

b. What is the constant of proportionality? Explain what this means.

c. How many pages would the student read if they read for 9 hours?

9) II. The table below shows the number of miles driven and the number of gallons of gas consumed by a car. Use the table below to complete parts a-c.

Gas (gallons)	0	0.8	1.2	1.6	2.0	4.0	12.0
Miles	0	20	30	40	50	100	300

a. Pick two ordered pairs on the table, and test to see if they are proportional.

b. What is the constant of proportionality? Explain what this means.

c. How many gallons of gas would you consume if you drove 175 miles?

10) III. Which table below represents a proportional relationship? Explain how you know.

Time	Dollars
1	60
2	80
3	100

Time	Dollars
1	15
2	20
3	30

Time	Dollars
1	48
2	96
3	144

Independent Practice:

The tables below show the cost of three different types of fruit by weight. Use the tables to answer the questions.

11)

Blueberries

Weight (lbs)	Cost (dollars)
2	$6.00
4	$12.00
6	$18.00
8	$24.00

1.) Is the cost of blueberries directly proportional to the weight? Explain your answer.

2.) What is the constant of proportionality? Explain what it means.

3.) How much would 15 pounds of blueberries cost?

12)

Strawberries

Weight (lbs)	Cost (dollars)
3	$5.25
5	$8.75
7	$12.25
9	$15.75

1.) Is the cost of strawberries directly proportional to the weight? Explain your answer.

2.) What is the constant of proportionality? Explain what it means.

3.) How many pounds of strawberries could you buy $26.25?

13)

Raspberries

Weight	Cost (dollars)
1.5	$2.10
3.5	$4.90
4.5	$6.30
6.5	$9.10

1.) Is the cost of raspberries directly proportional to the weight? Explain your answer.

2.) What is the constant of proportionality? Explain what it means.

3.) How many pounds of raspberries can you buy with $11.55?

④

14) Graphing Proportional Relationships

When a proportional relationship is graphed, it will always form a _____ _____, and it will always pass through the _____ of the graph (0,0)

In other words: proportional relationships are <u>linear</u>, and pass through the <u>origin (0, 0)</u>.

I.) Mark is filling his new pool with water. The table below shows the average amount of water (gallons) that fill the pool in a given number of minutes:

Minutes (m)	0	1	2	3	4	5
Gallons of water (g)	0	12	24	36	48	60

A) Use two ordered pairs to create a proportion to show that this is a **proportional relationship.**

B) What is the constant of proportionality? What does that mean?

C) Write an equation to show the relationship between minutes passed (m) and gallons filled (g)
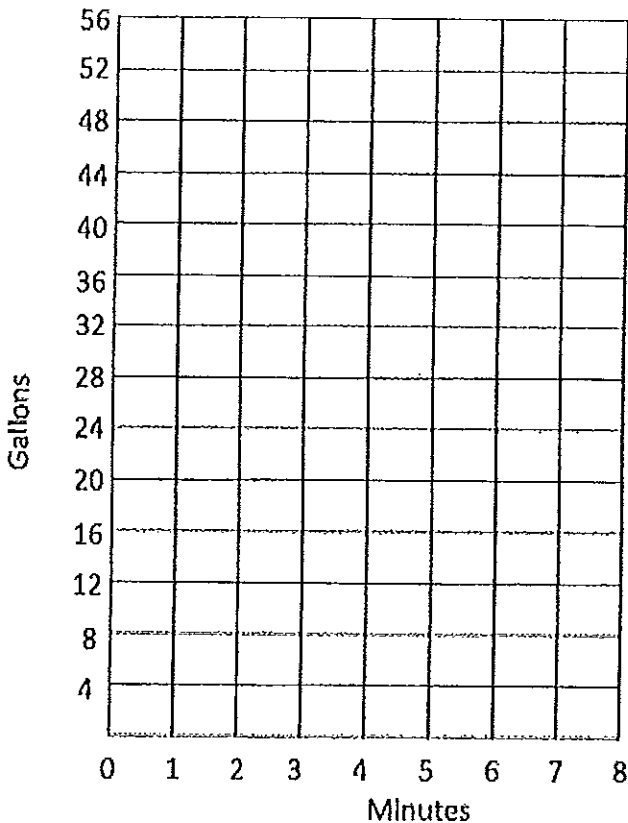
_____

D) Graph the data on the graph to the left. Mark the constant of proportionality with a star.

E) Does the graph show a proportional relationship (direct variation)? How do you know? (Give two pieces of evidence)


Gallons

Minutes

⑤

II.) The table shows the cost of buying Mathletes t-shirts to wear to the next competition.

# of shirts	0	2	4	6	8	10
total cost	0	11.00	22.00	33.00	44.00	55.00

A) Use two ordered pairs to create a proportion to show that this is a **proportional relationship.**

B) What is the constant of proportionality? What does that mean?

C) Write an equation to show the relationship between number of shirts bought (s) and price (p)
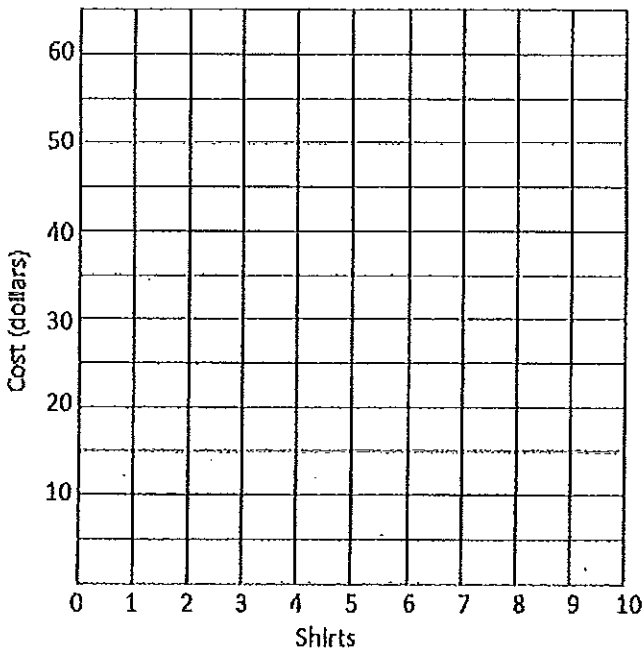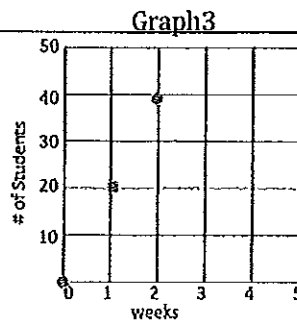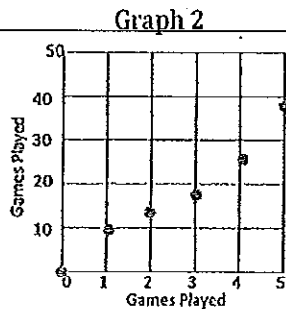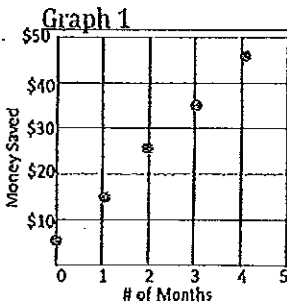
_____

D) Graph the data on the graph to the left. Mark the constant of proportionality with a star.

E.) Does the cost of shirts vary directly with the number of shirts purchased? Give two pieces of evidence.

III. Determine whether each graph is proportional. If it is proportional, give the constant of proportionality.

Graph 1	Graph 2	Graph3	Graph 4
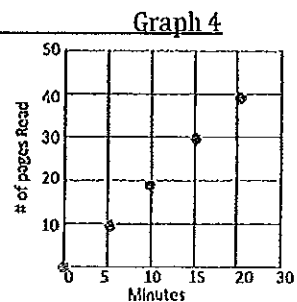
17) Proportional Equations:

The equation for a proportional relationship or a direct variation can be written as _____.

Where k represents the _____.

For example: In the equation y=5x, the coefficient 5 would represent the _____

_____ _____ or in other words the _____ _____.

A proportional equation does not have a _____, or has a constant of zero.

I.) The following table describes the relationship between the number of scoops in an ice cream cone (x) and the price of the cone (y)
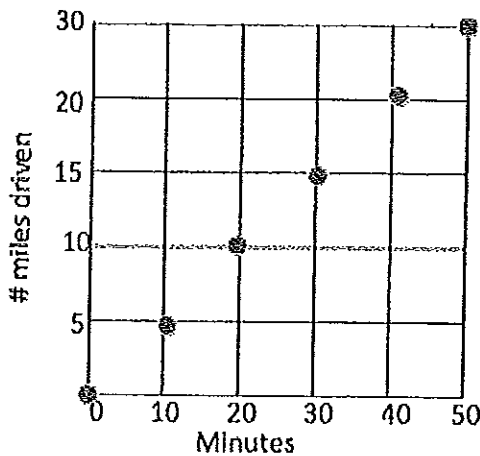
# of scoops (x)	Price (y)
0	0
1	1 ¾
2	3 ½
3	5¼

a. What is the constant of proportionality? _____

b. Write an equation to represent this proportional relationship: _____

c. Use your equation to calculate the number of ice cream scoops you could buy with $28.00.

_____

18) II. The following graph shows the relationship between the number minutes passed, and the number of miles driven.

a. What is the constant of proportionality? Explain what it means

b. Write an equation to represent this proportional relationship: _____

c. Use your equation to calculate the number of miles you would drive in 75 minutes.

_____

19) III. Which equations below represent a proportional relationship?

a. $y = 5x$

b. $y = 1.5x + 2$

c. $p = 0.5m$

d. $c = 6 + 3d$

e. $y = \frac{1}{2}x$

f. $m = 3n$

g. $y = 9 - 5x$

h. $t = \frac{1}{4}x - 10$