Name: _____ Date: _____

Ms. Napolitano Activity: 6.1

Topic: Expressions

Homework

MIT

A soccer coach bought 16 medium T-shirts and 9 large T-shirts. Each T-shirt was the same price. Onaje and Paula tried to write equivalent expressions to represent the total price of the T-shirts. The expressions they wrote are shown below.

Onaje: $16t + 9t = t(16 + 9) = 25t$
Paula: $16t + 9t = 16 + 9 + 2t = 25 + 2t$

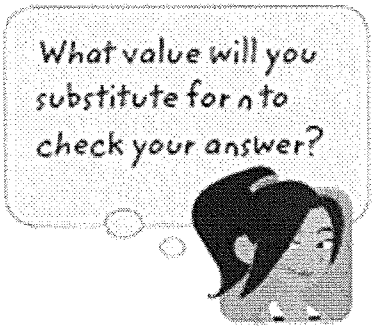
Whose expression is correct? Why is the other expression incorrect?

_____

_____

Are $5n + 9 + n$ and $3(2n + 9)$ equivalent expressions? Use substitution to check your answer.

Show your work.



Solution: _____

Look at each expression below. Is it equivalent to $42x - 56y$? Select Yes or No for expressions A–D.

A	$7(6x - 8y)$	☐ Yes	☐ No
B	$40(2x - 16y)$	☐ Yes	☐ No
C	$14(x + 2x + 7y - 3y)$	☐ Yes	☐ No
D	$42(x + 14y)$	☐ Yes	☐ No

_____

The expression $0.25(2d + 1)$ represents the fines per day, d, for overdue books. Which expression is equivalent to $0.25(2d + 1)$?

A $0.252d + 1$

B $0.50d + 0.25$

C $2d + 0.25$

D $0.50d + 1$

A game company makes a board game that comes with 2 dice and a card game that comes with 3 dice. Which expression shows the total number of dice in b boxes of the board game and b boxes of the card game?

A $5b$

B $5(2b)$

C $5 + b$

D $2b + 3$

Look at the equations below. Choose True or False for each equation.

A	$f + f + f = 3f$	☐ True	☐ False
B	$4 \times n \times n \times n \times n = 4n^4$	☐ True	☐ False
C	$10h - 10 = 10 - 10h$	☐ True	☐ False
D	$x^2 + 3v = (x + x) + v \times v \times v$	☐ True	☐ False
E	$6 \times (2 + 7) = (6 \times 2) + 7$	☐ True	☐ False

Name: _____ Date: _____

Ms. Napolitano Activity: 6.1

Topic: Equations

I can use substitution to determine whether a given number in a specified set makes an equation or inequality true.

Homework

Solve the problems.

1 Which value makes each equation true?

Write a value for the variable that makes each equation true. Use the values in the box below. Not all values will be used.

$\frac{2}{7}$	$\frac{3}{7}$	$\frac{9}{7}$	$\frac{10}{7}$	43	71

$y + \frac{4}{7} = \frac{6}{7}$	$17 + b = 60$	$\frac{6}{7} = m + \frac{3}{7}$

2 Siera has 11.5 yards of yarn. She uses a certain amount for a project, leaving 5.25 yards of yarn. The equation $11.5 - x = 5.25$ represents this situation, where x is the amount of yarn Siera used for her project.

How much yarn did Siera use for her project?

A 5.25 yards

B 5.75 yards

C 6.25 yards

D 6.5 yards

3 Harry solves the equation $\frac{1}{3}t = 15$. He says the solution is 30.

Is his solution correct?

Fill in the blanks to explain how Harry can check whether his solution is correct.

Harry can first substitute _____ for t. He can then multiply $\frac{1}{3}$ by _____ to get a product of _____. Since 15 _____ equal to _____, Harry's solution _____ correct.

4 Write a real-world problem that you could represent with the equation $20 - n = 4$. Solve the equation to find the answer to your problem.

_____

_____

_____

_____

_____

RSCS Name:_____

Class:_____ Date:_____

Duke Homework:

These questions have several parts to them like the one we did at the end of class. However, it is not separated into parts a,b,c,d and so on like the example we did. You must read the question and break it apart in order to find out what we need to do.

Joshua does not want to spend more than $22 on a long-sleeved shirt. Which description of shirt prices would keep Joshua within his spending limit, not including tax? Select all that apply.

A 15% off $25

B 30% off $32

C $19.65 plus a $2.35 shipping fee

D $20.45 plus a $1.60 shipping fee

The Outdoor Furniture Center buys wooden benches for $50 each. The furniture store owner adds a 200% markup to the cost of the bench. After hearing from customers that the selling cost of the bench is too high, the owner changes the markup to 120%. How much less per bench does the store owner make with the lower markup?

Show your work.

Answer The owner makes _____ less per bench using the lower markup.

The owner of the Outdoor Furniture Center decides to use the 120% markup. At the end of the season, he wants to sell all the benches that are in stock. He sells the benches for 20% off. What is the total price of a bench with this discount plus a 5% sales tax?

Show your work.

Answer: the total price of a bench with the discount and sales tax is_____

CHALLENGE: YOU CAN DO IT!!!!!!

The regular price for a pair of shoes is $48. The store is having a buy one get one $\frac{1}{2}$ off sale. If you buy 2 pairs of shoes for that price, what percent discount is that?

Show your work.

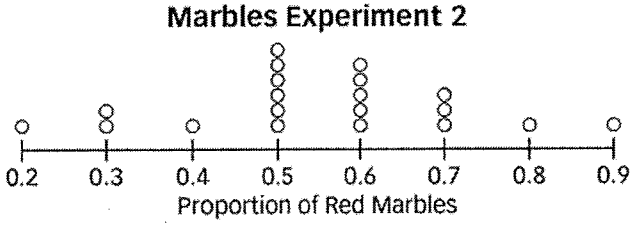
(remember: you are buying TWO PAIRS. You are only given the price of ONE PAIR.) think about what operations you might use. It will be different because we are not finding the percent)

Cambridge

Ms. Frost

Imagine every student made their own jar of marbles. Every student would have a different number of red marbles in their jar. A students distribution of outcomes for 20 samples is shown.

Suppose one of your classmates used a different number of reds. Her dot plot is shown below. What is a good estimate for the number of reds in her bag? Explain.



Lets create a box and whiskers plot to represent the data

With A Partner:

Example

A box contains 80 loose white or yellow golf balls. Each student in Mr. Koger's class drew a random sample of 20 balls from the box, counted the yellow balls, and then returned the sample to the box.

Nate calculated the proportion of balls in each sample that were yellow, and then he organized the results in the following table.

Student	1	2	3	4	5	6	7	8	9	10	11	12
Number of Yellows	6	5	6	8	5	7	3	6	2	6	6	5
Proportion of Yellow	0.3	0.25	0.3	0.4	0.25	0.35	0.15	0.3	0.1	0.3	0.3	0.25

1. Marta believes it will be easier to identify clusters of data if the results are represented with a dot plot. Do you agree? Explain.

2. Create a dot plot to display the proportion of yellow balls in each sample.

Ms. Frost

3 According to the data, what is a good estimate for the number yellow balls in the box? Explain.

Solve. Use the following situation for problems 4–6.

A box in Ms. Booth's class contains 200 loose white or yellow golf balls. The table below represents the results when 11 students each drew a random sample of the same number of balls, counted the number of yellows, and then returned the sample to the box.

Student	1	2	3	4	5	6	7	8	9	10	11
Proportion of Yellow	0.6	0.7	0.3	0.7	0.5	0.9	0.8	0.8	0.7	0.7	0.9

4 Which graphic representation of the data (a table, a dot plot, or a box plot) would best help estimate the number of yellow balls in the box?

5 Construct a box plot to display the data from Ms. Booth's class.

6 Lana believes a good estimate of the number of yellow balls in the box is 70 balls. Do you agree? Explain how she may have arrived at that answer.

Caltech

1 What do the rates of change in the example represent?

2 What does it mean in the context of the example that Alyssa's rate of change is greater than Sarah's?

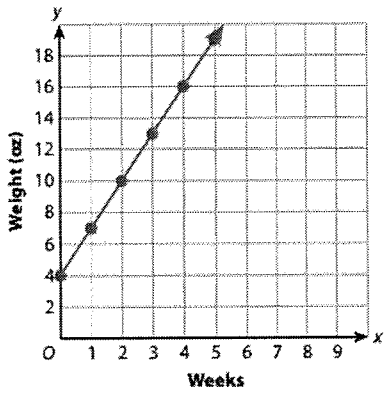
3 Write ordered pairs for the initial values of each function in the example. Tell what the initial values represent.

4 The table shows the weight gain of a kitten over a 5-week period. The graph shows the weight gain of a second kitten over the same period. Compare the rates of change for these two functions.

Kitten A

Week	Weight (oz)
0	3
1	7
2	11
3	15
4	19
5	23

Kitten B



5 Sonya sells bracelets once a month at a flea market. The table shows her profits for a 5-month period.

Sonya

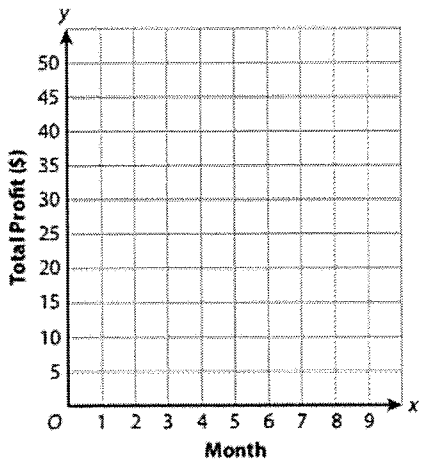
Month	1	2	3	4	5
Total Profit ($)	30	60	90	120	150

a. Kirsten sells bracelets once a month at a different flea market. The rate of change for her profits is $10 per month. Complete the table and the graph to show her total profits.

Kirsten

Month	1	2	3	4	5
Total Profit ($)	10				

Kirsten



b. Sonya says that her profit is increasing 4 times as fast as Kirsten's profit. Do you agree? Explain.

Comparing Negative Rates of Change

Example

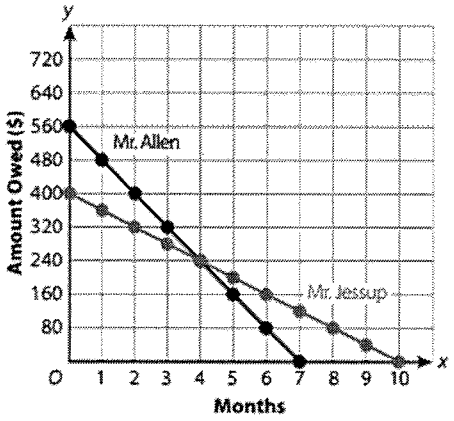
Mr. Allen bought a new computer. His monthly payment plan is shown in the table.

Month	0	1	2	3	4	5	6	7
Amount Mr. Allen Owes ($)	560	480	400	320	240	160	80	0

Mr. Jessup buys a new computer for $400. He makes monthly payments of $40 until the computer is paid for. Compare the initial values and rates of change of each function.

You can graph both functions to show that the amount Mr. Allen owes starts at $560 and decreases $80 per month. The amount that Mr. Jessup owes starts at $400 and decreases $40 each month.

Payment Plans



Mr. Allen's initial value is $160 more than Mr. Jessup's. Mr. Allen's rate of change is greater than Mr. Jessup's rate of change.

1. What do the initial values mean in the context of the example problem?

_____

2. Do the functions in the example show positive or negative rates of change? Explain.

_____

3. Write an equation for each function, where x is the number of months and y is the amount owed.

Mr. Allen's plan: _____

Mr. Jessup's plan: _____

WITH YOUR PARTNER:

Roy wants to buy a new television for $300. Two stores offer different payment options. Compare the initial values and rates of change.

Store A Payment Plan

Month	0	1	2	3	4	5	6
Amount Owed ($)	300	250	200	150	100	50	0

Store B Payment Plan

Pay $100 at the time of purchase. Pay $50 per month until the television is paid for.

Show your work.

Solution: _____

GROUP WORK:

Calteen

1) The equation and table show what two boys pay for gym fees. Compare the rate of change and initial value for each function.

Alfredo

Month	0	1	2	3
Cost	20	30	40	50

Alex

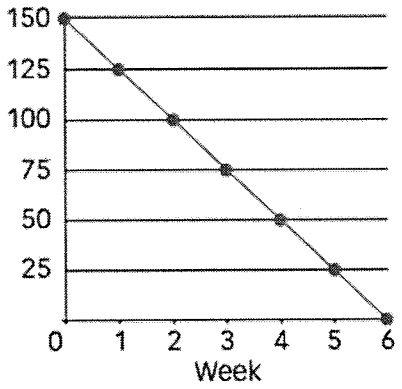
$c = 25 + 10m$, where c = cost and m = number of months.

Show your work.

Solution: _____

2) Roy wants to buy a new wireless phone for $200. Two stores offer different payment options. Which plan has a greater initial value? Which plan has a greater rate of change?

Store A Payment Plan



Store B Payment Plan

Pay $50 at the time of purchase. Pay $20 per month until the phone is paid for.

Show your work.

_____

_____

Solution: _____

_____

3) Which statement about these equations is true?

Equation A: $y = 3x + 4$

Equation B: $y = 5x + 2$

A Equation A has a greater rate of change.

B Equation A has a greater initial value.

C Equation B has a greater initial value.

D Both equations have the same initial value.

Ben chose **C** as the correct answer. How did he get that answer?

_____

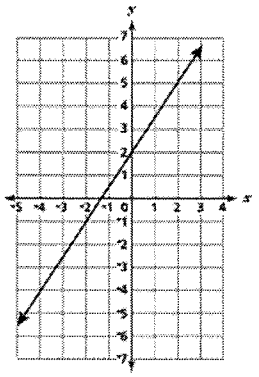
_____

_____

HOMEWORK

Solve the problems.

1 The graph shows a function.



Which equation represents a function with a rate of change that is less than the rate of change of the function shown in the graph? Select all that apply.

A $y = 2x - 4$

B $y = \frac{5}{3}x + 1$

C $y = \frac{3}{2}x - 1$

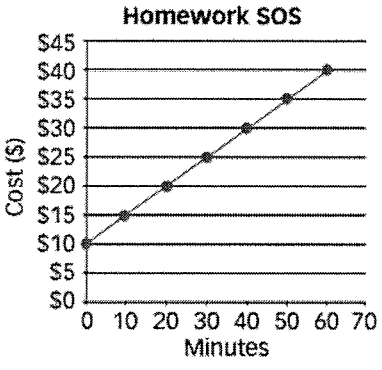
D $y = x + 3$

E $y = \frac{x}{2} + 5$

2 For each verbal description, write in the correct equation from the choices provided.

Samantha begins her road trip with 30 gallons of gasoline in the tank of her van. Her van gets 25 miles to the gallon. Let y represent the number of gallons of gasoline in the tank after x miles of travel.		$y = 30 + 0.25x$
		$y = 30 - \frac{x}{25}$
Evan has a cell phone plan that costs \$30 per month and \$0.25 per minute of phone use. Let y represent the monthly cost of cell phone service after x minutes of phone use.		$y = 25 - \frac{x}{30}$
		$y = 25 + 0.30x$

3 The rates for two homework help services are shown below.



Homework Lifeline

Rates for Our Services

- Pay \$25 to set up an account with our service.
- Then pay \$0.40 for each minute of homework assistance that you receive.

Caltech

Part A

Which service has the greater rate of change? Which has a greater initial value? Describe what this means in the context of the problem.

Show your work.

Answer _____

_____

_____

Part B

What would be the total cost for setting up an account and receiving 90 minutes of homework assistance at each company?

Show your work.

Answer _____