Name_____ Period: _____

Packet 17: Solving Two-Step Equations

Goal: Get the variable on one side of the equation by itself.

Steps to solving a two-step equation:

1. **Do the inverse operation for addition or subtraction.**
2. **Do the inverse operation for multiplication or division.**
3. **Check your answer**

Let's Try It!

1) $4x-8=16$	2) $\frac{y}{12}-5=11$
3) $3.2x+2.6=-23$	4) $-6.85+\frac{m}{4}=-11$

Two-Step Equation Practice

Solve and check the equations below. Show all your work.

1.) $\frac{x}{4}+10=1$	2.) $0.7t-3.2=1.7$	3.) $10-5m=45$
4.) $3x+9=27$	5.) $-5.6=\frac{h}{5}+12.2$	6.) $-3x-10=-46$
7.) $174=48n-18$	8.) $-61=7y-26$	9.) $\frac{y}{5}-9=11$

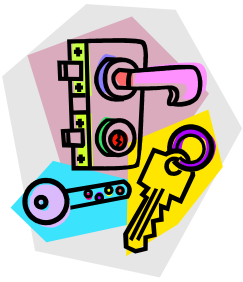
Algebra
Two Step Equation Practice

Name_____

Solve each equation below. Show all necessary work

O. $4y - 9 = 15$	A. $6x + 7 = -5$
S. $-9t + 2 = 56$	P. $-69 = 7v - 6$
Y. $35 = -2x - 15$	I. $4 - 3n = 43$
N. $12 - 5u = -48$	C. $-27 + 20w = 73$
E. $13 = 5 - 8m$	K. $11r + 60 = 16$

U. $y - 24 = -7$	J. $23 - x = 13$
V. $-67 = 6x - 1$	M. $-4e - 9 = 19$
D. $-8 = 32 - 5q$	H. $6 + 10k = 256$
T. $-100 = 12t - 4$	L. $36 - x = -36$



Below are the titles of three "Books Never Written." To decode the names of their authors find your solution in the code below. Each time the solution appears, write the letter of that problem above it.

The Break-in by: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

10 -13 -7 -7 -25 8 72 6 5 - 4

Making Soap by: ___ ___ ___ ___ ___ ___ ___ ___ ___

-9 25 -13 72 -8 25 -2 12 -6

Origin of Man by: ___ ___ ___ ___ ___ ___ ___ ___ ___

-1 -11 -2 72 17 -6 25 17 12

FACEing MATH™ Name: _____

Lesson 4: Solving Two-Step Equations using Addition, Subtraction, Multiplication, and Division

Directions: ***Solve each equation and use a pencil to DRAW the object that corresponds with your answer. SHOW YOUR STEPS!!!***

1. $2x + 1 = 7$

(a) If your answer is $x = 3$ draw the following ears.	
(b) If your answer is $x = 4$ draw the following ears.	

2. $4x - 2 = 6$

(a) If your answer is $x = 8$ draw a small patch of hair on the top of the head.	
(b) If your answer is $x = 2$ draw a small patch of hair above each of the ears.	

3. $-12x - 3 = -51$

(a) If your answer is $x = 4$ draw the following glasses and eyes.	
(b) If your answer is $x = -4$ draw the following glasses and eyes.	

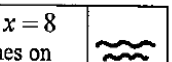
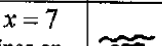
4. $14 = 11x + 3$

(a) If your answer is $x = 1$ draw the following LARGE nose and mustache.	
(b) If your answer is $x = 11$ draw the following LARGE nose and mustache.	

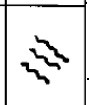
5. $-6 + 8x = -38$

(a) If your answer is $x = 4$ draw the following skinny eyebrows.	
(b) If your answer is $x = -4$ draw the following bushy eyebrows.	

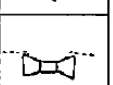
6. $3 + 6x = 45$

(a) If your answer is $x = 8$ draw two wrinkle lines on the forehead.	
(b) If your answer is $x = 7$ draw three wrinkle lines on the forehead.	

7. $3x - 10 = -1$

(a) If your answer is $x = 3$ draw two wrinkle lines on each cheek.	
(b) If your answer is $x = -3$ draw three wrinkle lines on each cheek.	

8. $25 = 25 + 5x$

(a) If your answer is $x = 0$ draw a necktie on the shirt.	
(b) If your answer is $x = 1$ draw a bow tie on the shirt.	

9. $-2 + 6x = 16$

(a) If your answer is $x = 3$ write the scientific term for water (H_2O) on the shirt.	H_2O
(b) If your answer is $x = 2$ draw a pencil coming out of a pocket on the shirt.	

10. $2 + 7x = 65$

(a) If your answer is $x = 9$ draw a light bulb above the head.	
(b) If your answer is $x = 8$ draw a broken light bulb above the head.	

11. $20 = 14x - 8$

(a) If your answer is $x = 2$ draw a science beaker with bubbling liquid.	
(b) If your answer is $x = -2$ draw a science beaker on fire.	

12. $2x + 7 = -15$

(a) If your answer is $x = -4$ write the formula $A = \frac{1}{2}bh$ on the background.	$A=\frac{1}{2}bh$
(b) If your answer is $x = -11$ write the formula $E=mc^2$ on the background.	$E=mc^2$

13. $3x + 5 = 14$

(a) If your answer is $x = -3$ color the ears yellow.
(b) If your answer is $x = 3$ color the ears orange.

14. $-10 = -4x - 10$

(a) If your answer is $x = -4$ color the hair on the head brown.
(b) If your answer is $x = 0$ color the hair on the head gray.

15. $5 + 8x = 37$

(a) If your answer is $x = 3$ color the eyes green.
(b) If your answer is $x = 4$ color the eyes blue.

16. $-16x - 2 = 46$

(a) If your answer is $x = -3$ color the glasses purple.
(b) If your answer is $x = 3$ color the glasses red.

17. $19 = 2x + 3$

(a) If your answer is $x = 8$ color the nose pink.
(b) If your answer is $x = 11$ color the nose red.

18. $5x - 7 = -67$

(a) If your answer is $x = -12$ color the mustache gray.
(b) If your answer is $x = 12$ color the mustache brown.

19. $22 = 7 + 3x$ (a) If your answer is $x = 4$ outline all the facial wrinkles in brown. (b) If your answer is $x = 5$ outline all the facial wrinkles in black.	20. $4x + 2 = 10$ (a) If your answer is $x = 2$ color the eyebrows brown. (b) If your answer is $x = 3$ color the eyebrows gray.	21. $-3x - 4 = 5$ (a) If your answer is $x = 3$ color the tie purple. (b) If your answer is $x = -3$ color the tie red.
22. $7 + 4x = 27$ (a) If your answer is $x = 5$ outline all the letters/numbers in black. (b) If your answer is $x = 4$ outline all the letters/numbers in red.	23. $12 = 10x + 12$ (a) If your answer is $x = 1$ color the shirt yellow. (b) If your answer is $x = 0$ color the shirt blue.	24. $2x - 9 = -3$ (a) If your answer is $x = 3$ color the face, neck, & arms orange. (b) If your answer is $x = -6$ color the face, neck, & arms yellow.
25. $-15 + 4x = 33$ (a) If your answer is $x = 12$ color the light bulb yellow. (b) If your answer is $x = 48$ color the light bulb orange.	26. $84 = -20x + 4$ (a) If your answer is $x = -4$ color the beaker purple. (b) If your answer is $x = 4$ color the beaker red.	27. $5x + 4 = 24$ (a) If your answer is $x = 5$ color the background red. (b) If your answer is $x = 4$ color the background green.

Why does a golfer wear two pair of pants?

-4	-3	3	5	-6	7	-5	7	6	7	9	-6	5	-5	8	-7	7	-4	-3	8	-3	7

Solve the following problems. Put the letter on the line above the answer. When you are done you will have solved the riddle.

I $-3x + 6 = 18$

T $-8x + 10 = -62$

E $4 + 3x = 25$

G $4x + 2x + 5 = 41$

O $5x - 8 = 32$

C $3 + 6x = 21$

H $5 - 2x = 15$

S $8x + 10 = -38$

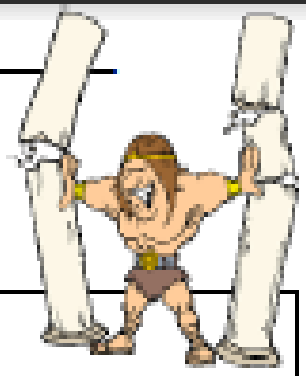
A $-36 = -4x - 16$

L $-5 + 3x = -26$

N $8x - 5 = -29$

Solving Equations Name_____

Solve the following equations for the value of x. When you are finished, go to the web site http://www.quia.com/cm/111362.html. The questions on this page will appear at this site. Match the columns to check your answers.



$3x - 1 = 26$	$x + 15 = 20$
$2x + 1 = 7$	$4x + 4 = 20$
$5x = 40$	$3x + 5 = 11$
$3x + 5 = 26$	$2x - 4 = 20$
$2x + 2 = 4$	$6x + 2 = 38$

Two-Step Equation Word Problems

Steps to solving two-step word problems:
1. Read the problem carefully. Underline any key information.
2. Write a let statement.
3. Write an equation.
4. Solve the equation.
5. Check your answer

Example 1:

Nick opens a savings account with $50. Each week after, he deposits $15. In how many weeks will he have saved $500?

Step 1: Underline any key information

Step 2: Write a let statement. What does our variable represent?

Step 3: Write an equation:

Step 4: Solve the equation:

Step 5: Re-read the question. Does your answer make sense?

Example 2:

Alex rents a car for one day. The charge is $18 plus $0.12 per mile. Alex wants to spend exactly $30. How many miles can he drive?

Step 1: Underline any key information

Step 2: Write a let statement. What does our variable represent?

Step 3: Write an equation:

Step 4: Solve the equation:

Step 5: Re-read the question. Does your answer make sense?

Example 3:
Katie wants to buy a bicycle that costs $129. This is $24 more than 3 times what she saved last month. How much did she save last month?

Two-Step Equation Word Problems Classwork

Solve the following problems and show all your work.
(Remember to use the 5 steps for solving two-step equation word problems!)

1. Ben rents a car for one day. The charge is $20 plus the $0.12 per mile. He wants to spend exactly $80. How many miles can he drive?

2. When 12 is subtracted from 3 times a number, the result is 24. Find the number.

3. Jill made 20 muffins. She put them into 3 boxes and has two muffins left. How many are in each box if they all contain the same amount of muffins?

4. If you multiply a number by 3 and then subtract 5, you will get 40. What is the number?

5. Joe went to the hobby shop and bought 2 model sports cars at $8.95 each and some paints. If he spent a total of $23.65, what was the cost of the paints?

6. Ryan made a $3000 down payment on a car. The total cost of the car was $7500. He made 36 equal monthly payments to pay the car in full. How much did Ryan pay per month?

7. Kendra is buying bottled water for a class trip. She has 16 bottles left over from the last trip. She buys bottles by the case to get a good price. Each case holds 24 bottles. How many cases will she have to buy if she wants to have a total of 160 bottles of water?

Two-Step Review

_____ 1) Which of the following refers to the operation of addition?

(1) product (3) more than

(2) less than (4) quotient

_____ 2) Which of the following refers to the operation of division?

(1) product (3) more than

(2) less than (4) quotient

_____ 3) Five less than twelve times a number is represented by:

(1) $12n-5$ (3) $12-n-5$

(2) $12n5$ (4) $5-12n$

_____ 4) Which of the following represents three times a number minus 5?

(1) $\frac{3}{x}-5$ (3) $3x-5$

(2) $5x-3$ (4) $3-5x$

For 5 - 8, solve the equation for x. Clearly show ALL of your work.

5) $7+4x=67$	6) $0.7x-3.2=1.7$

7) $\frac{3x}{5} = -6$

8) $10 - 5x = 35$

For 9-10, set up and solve a mathematical equation to determine your solution.

BE SURE TO SHOW ALL OF YOUR WORK.

9) Scott wants to buy a scooter that costs $129. This is $24 more than 3 times what he saved last month. How much did he save last month?

10) Miss Violet is buying granola bars for her students. She already has 16 granola bars in her desk and needs a total of 100 bars. They are sold in packs of 12. How many more boxes of granola bars does she need to purchase for her students?