U3D1_T_Solving Simple Equations

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U3D1_T_So
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QUIZ #1:

QUIZ#2:

UNIT 3 TEST:

U3D1 Warm Up:

List the opposite operation for each of the following:

adding subtracting

subtracting adding

multiplying dividing

dividing multiplying

MPM 1DI – Unit 3 - Equations

Day 1 - Solving Simple Equations

When we are asked to solve an equation we are trying to determine what value of x makes the mathematical statement true.

By inspection we can see that if x = 18 the statement is true. BUT....Not all equations can be solve by inspection. To solve equations we want to isolate the variable (ie., Get the variable by itself.)

For example when solving

An equal sign in the middle means that whatever is on the left side is balanced with whatever is on the right side.

When working with equations we need to keep the equation balanced... **Therefore, whatever is done to one side needs to be done to the other side as well! To isolate the variable we use the opposite operation!**

$$x - 3 = 15$$
$$x - 3 + 3 = 15 + 3$$
$$x = 18$$

Example 2: Solve

a) $x + 4 = 70$

$x+4-4 = 70-4$

$x = 66$

b) $25 = 5 + x$

$25-5 = 5+x-5$

$20 = x$

c) $3x = 15$

$\frac{3x}{3} = \frac{15}{3}$

$x = 5$

d) $6y = -48$

$\frac{6y}{6} = \frac{-48}{6}$

$y = -8$

e) $\frac{b}{4} = 16$

$\frac{b}{4} \times 4 = 16 \times 4$

$b = 64$

f) $\frac{y}{2} = -3$

$\frac{y}{2} \times 2 = -3 \times 2$

$y = -6$

When solving multi - step equations, we need to isolate the variable term first, THEN isolate the variable.

Example 3: Solve

a) $4k - 7 = 9$

$4k - 7 + 7 = 9 + 7$

$4k = 16$ variable term, 4k is isolated

$\frac{4k}{4} = \frac{16}{4}$

$k = 4$ variable, k is isolated

b) $3x - 2 = 10$

$3x - 2 + 2 = 10 + 2$

$3x = 12$

$\frac{3x}{3} = \frac{12}{3}$

$x = 4$

c) $\frac{y}{4} + 7 = 12$

$\frac{y}{4} + 7 - 7 = 12 - 7$

$\frac{y}{4} = 5$

$\frac{y}{4} \times 4 = 5 \times 4$

$y = 20$

Example 4: Solve the following and check your answer:

$3x - 8 = 7$

$3x - 8 + 8 = 7 + 8$

$\frac{3x}{3} = \frac{15}{3}$

$x = 5$

When checking the solution use proper form
using the Left Side / Right Side technique

Check:

Left Side	Right Side
$3x - 8$	7
$3(5) - 8$	
$= 15 - 8$	
$= 7$	

$\therefore LS = RS$

$\therefore x = 5$

Example 5: Fred is building an ultralight airplane. The fuel tank is made of plastic and has a mass of 5000g. Each litre of gasoline has a mass of 840g. The total mass of the fuel plus the tank can not exceed 21 800 g.

a) Write an equation to model the number of litres of gasoline that the tank may hold.

$5000 + 840m = 21800$, where m is the mass of gasoline (L)

b) Solve the equation to determine the number of litres in a fuel tank

$5000 + 840m - 5000 = 21800 - 5000$

$840m = 16800$

$\frac{840m}{840} = \frac{16800}{840}$

$m = 20$

∴ the tank will hold 20 L of gas.

U3D1 Practice: Pg. 193-195 #3, 5, 6, 8-13, 16, 18, 20