Sept 14, 2016

Unit 1: Linear Equations

Day 3: One and Two Step Equations

Today we will....

1. Learn strategies to solve for the variable in algebraic equations.

MFM 2PI - Equations
Solving One Step Equations

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

ex. $x + 5 = 8$

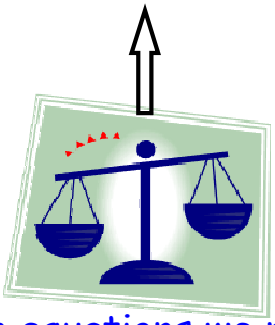
If x = 3 the statement is true.

To solve equations we want to get the variable term by itself by performing the opposite math operation.

Operation	Opposite
+	−
−	+
x	÷
÷	x

For example, when solving

$x - 3 = 15$



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.

$x - 3 + 3 = 15 + 3$

$x = 18$

Pull

Example 2: Solve

a) $x + 4 = 70$

$x + 4 - 4 = 70 - 4$

$x = 66$

b) $25 = 5 + x$

$25 - 5 = 5 - 5 + x$

$20 = x$

$x = 20$

c) $3x = 15$

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

$x = 5$

d) $6y = -48$

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

$y = -8$

Example 3: Solve

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

$4\left(\frac{b}{4}\right) = 4(16)$

$b = 64$

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

$2\left(\frac{y}{2}\right) = 2(-3)$

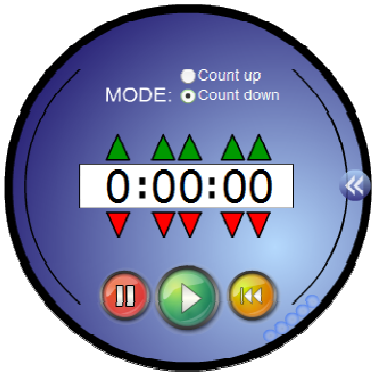
$y = -6$

c) $f + \frac{1}{3} = \frac{2}{3}$

$f + \frac{1}{3} - \frac{1}{3} = \frac{2}{3} - \frac{1}{3}$

$f = \frac{1}{3}$

Take the next 15 minutes and work on Page 159 #3 and #4.
Your homework should be done on a separate sheet of paper, properly labelled at the top (Unit 1, Day 3 Homework). Remember, all homework is handed in so that it can be marked! Anything not done will need to be completed for homework.



Solving Two Step Equations

Solve: $2x+5=15$

Step 1: Collect any like terms (put all variable terms on one side of the equal sign)

Step 2: Isolate the variable (divide to get the coefficient of the variable to 1)

$2x+5-5=15-5$

$2x=10$ ✓

$\frac{2x}{2}=\frac{10}{2}$

$x=5$ ✓

Solve: $\frac{2}{5}a=-4$

Step 1: Multiply both sides by the denominator (this will get rid of the fraction)

Step 2: Isolate the variable (divide to get the coefficient of the variable to 1)

$5\left(\frac{2}{5}a\right)=5(-4)$

$2a=-20$

$\frac{2a}{2}=\frac{-20}{2}$

$a=-10$

Example : Solve

a) $-4 = -3x + 2$

$-4-2 = -3x+2-2$

$-6 = -3x$

$\frac{-6}{-3} = \frac{-3x}{-3}$

$2 = x$

b) $8 - 4x = -8$

$8-8-4x = -8-8$

$-4x = -16$

$\frac{-4x}{-4} = \frac{-16}{-4}$

$x = 4$

c) $9 = \frac{3}{4}z$

$4(9) = 4\left(\frac{3}{4}z\right)$

$36 = 3z$

$\frac{36}{3} = \frac{3z}{3}$

$12 = z$

$z = 12$

d) $-\frac{5}{6}x - 5 = 15$

$-\frac{5}{6}x - 5 + 5 = 15 + 5$

$-\frac{5}{6}x = 20$

$6\left(-\frac{5}{6}x\right) = 6(20)$

$-5x = 120$

$\frac{-5x}{-5} = \frac{120}{-5}$

$x = -24$

Continue on your homework page.

You should complete Page 160, #5 (solve, don't list the steps!) and #6.

If you get done all four questions before the end of the class, make sure your name is on the homework page and hand it in. If you don't get all four questions done before the end of the class, you will need to complete them at home and hand them in next class.

QUIZ NEXT CLASS ON INTEGERS, ORDER OF OPERATIONS AND SIMPLIFYING ALGEBRAIC EXPRESSIONS.