Oct 7/2015

Solving Simple Equations

To solve an equation is to find the value of the variable in the equation which makes the equation true. The solution may also be called the root of the equation.

This is done by isolating the variable, which means moving the numbers to the other side of the equal sign using opposite operations.

Ex. Isolate x using opposite operations.

(a) $x + 3 = 10$

$-3 \quad -3$

$x = 7$

(b) $\frac{3x}{3} = \frac{12}{3}$

$x = 4$

(c) $-6 + x = 3$

$+6 \quad +6$

$0 + x = 9$

$x = 9$

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Balancing Equations!

When we write an equation (using an 'equals' sign), we are making a mathematical statement that both sides are equal.

It is possible to manipulate both sides mathematically and maintain this balance, keeping both sides equal.

Whatever you do to one side, you MUST do to the other!

	5 = 5	x = 5
add 3:	$8 = 8$	$x + 3 = 8$
	5 = 5	x = 5
multiply by 2:	$10 = 10$	$2x = 10$
	5 = 5	x = 5
add 3:	$8 = 8$	$x + 3 = 8$
multiply by 2:	$16 = 16$	$2(x+3) = 16$

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Ex. Solve

(a) $\frac{6m}{6} = \frac{27}{6}$

$m = \frac{27}{6_2}^{9}$

$m = \frac{9}{2}$

$m = 4.5$ ©

$m = 4\frac{1}{2}$ ©

(b) $8 \times \frac{x}{8} = 12 \times 8$

$x = 96$

$\frac{8}{1} \times \frac{x}{8}$

$= \frac{8x}{8}$

$= \frac{x}{1}$

$= x$

(c) $\frac{-4}{p} = 7$ ①

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(c) $\frac{-4}{p} = \frac{7}{1}$

① flip

$\frac{(-4)}{1}\frac{p}{-4} = \frac{1}{7}\frac{(-4)}{1}$

$p = \frac{-4}{7}$

② cross multiply

$\frac{-4}{p} \times \frac{7}{1}$

$\frac{7p}{7} = \frac{-4}{7}$

$p = \frac{-4}{7}$

③ multiply by p

$p \times \frac{-4}{p} = 7 \times p$

$\frac{-4}{7} = \frac{7p}{7}$

$-\frac{4}{7} = p$ ©

$p = \frac{-4}{7}$

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If there is more than one operation in the equation, work backwards through order of operations (BEDMAS).

Ex. Solve

(a) $2x + 5 = 9$

$-5 \quad -5$

$\frac{2x}{2} = \frac{4}{2}$

$x = 2$

(b) $4 - 3x = 8$

$-4 \quad -4$

$\frac{-3x}{-3} = \frac{4}{-3}$

$x = \frac{4}{-3}$ ©

$x = \frac{-4}{3}$

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Assigned Work:

p.193 # 2, 3
4, 5, 6, 8, 9, 10, 12
13, 16

6a
Bab
8ae
9a

6(a) $7x - 4 = 10$

$+4 \quad +4$

$\frac{7x}{7} = \frac{14}{7}$

$x = 2$

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8 ae

(a) $p+9=-2$

$-9 \quad -9$

$p=-11$

$-2-9$

$=-11$

(e) $10c-6=-16$

$+6 \quad +6$

$\frac{10c}{10}=\frac{-10}{10}$

$c=-1$

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9 (a) Let p represent the number of pies. ©✓

$\frac{7p}{7}=\frac{84}{7}$

(b)

$p=12$

∴ 12 pies were sold. ©✓

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10. (a) Let j be the # of jerseys.

$$\frac{50j}{50} = \frac{700}{50}$$

(b)

$$j = 14$$

$\therefore$ they can buy 14 jerseys.

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13. (a) $8r - \frac{3}{2} = -15$

$+\frac{3}{2} \quad +\frac{3}{2}$

$8r = -15 + \frac{3}{2}$ (×2 / ×2)

$8r = \frac{-30}{2} + \frac{3}{2}$

$\frac{8r}{8} = \frac{\frac{-27}{2}}{\frac{8}{1}}$

$r = \frac{-27}{2} \times \frac{1}{8}$

$r = \frac{-27}{16}$

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