Solving Multi-Step Equations   Oct 8/2015

1. Move all variables to one side. Try to end up
      with a positive coefficient for the variable.
2. Move all constants to the other side.
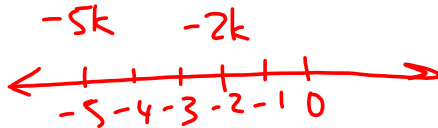3. Solve for the isolated variable.

Ex. Solve

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

$$-2x - 2 \qquad -2x - 2$$
$$x + 0 = 0 - 6$$
$$x = -6$$

$-5k \qquad -2k$

$-5\ -4\ -3\ -2\ -1\ \ 0$

(b) $8 - 5k = 7 - 2k$

$$-7 + 5k \qquad -7 + 5k$$
$$1 + 0 = 0 + 3k$$
$$\frac{1}{3} = \frac{3k}{3}$$
$$\frac{1}{3} = k \quad \text{Ⓒ} \quad \checkmark$$
$$k = \frac{1}{3} \quad \checkmark$$

Feb 27-1:50 PM

Recall: Distributive Property (expanding)

(a) $5(y - 3)$ (b) $2(y - 2)$

$= 5y - 15$ $= 2y - 4$

(c) $5(y - 3) + 2(y - 2)$

$= 5y - 15 + 2y - 4$

$= 7y - 19$

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When solving, try to keep the 'equals' sign aligned. Ⓒ

Ex. Solve $2(x-3) = -3(x+5) - 6$

$$2x - 6 = -3x - 15 - 6$$

$$2x - 6 = -3x - 21$$

$$+3x + 6 \qquad +3x + 6$$

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

$$x = -3$$

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For some solutions, you may be asked to verify your answer using a <u>formal check</u>.

The check has a specific form you must follow. Ⓒ

Ex. Verify that x = -6 is a solution to $3x + 2 = 2x - 4$

Oct 8-8:55 AM

Summary

   (1) Expand.
   (2) Isolate variables on one side.
   (3) Isolate constants on the other side.
   (4) Solve.
   (5) Verify (if required).

Assigned Work:

   p.200 # 1, 2, 4, 5, 9bdf, 10, 13, 15, 18

1(c) $4b = 2 - 8w - 3w$

    $4b = 2 - 11w$

   $+11w - 4b \quad -4b + 11w$

$$\frac{11w}{11} = \frac{-44}{11}$$

    $w = -4$

Rough

$-8w - 3w$
$= -11w$

(d) $3d + 4 - 9d + 12 = 0$

   $-6d + 16 = 0$
       $-16 \quad -16$

$$\frac{-6d}{-6} = \frac{-16}{-6}$$

$$d = \frac{-16}{-6} \, \frac{8}{3}$$

$$d = \frac{8}{3}$$

Feb 27-2:09 PM

$4(d) \quad k = 2(11 - k) + 14$ ① expand

    $k = 22 - 2k + 14$ ② simplify

    $k = -2k + 36$ ③ isolate k

 $k + 2k = 36$

   $3k = 36$ $[\div 3]$

   $k = 12$ divide both sides by 3

Oct 13-9:21 AM

3

5 df

(d) $3(t-4) = -2(t+3) + 14$

$3t - 12 = -2t - 6 + 14$

$3t - 12 = -2t + 8$

$+2t \quad +12 \qquad +2t \quad +12$

$5t \qquad = \qquad 20 \qquad [\div 5]$

$t = 4$

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9(d) $4(k-3) = 2 - 1(2k - 6)$

$4k - 12 = 2 - 2k + 6$
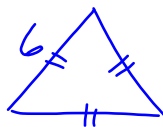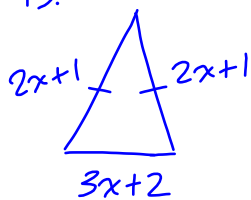
$4k - 12 = -2k + 8$

$+2k + 12 \qquad +2k + 12$

$\dfrac{6k}{6} \qquad = \qquad \dfrac{20}{6}$

$k = \dfrac{\overset{10}{\cancel{20}}}{\underset{3}{\cancel{6}}}$

$k = \dfrac{10}{3}$

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4

13.

$$P_1 = 2(2x+1) + (3x+2)$$

$$P_2 = 3(6)$$
$$= 18$$

$$P_1 = P_2$$
$$2(2x+1) + (3x+2) = 18 \quad \text{ok to start here!}$$

$$\vdots$$

solve for x

Oct 13-9:30 AM