

3.2 - Solving Multi-Step Equations

Vocabulary:

none

1 EXAMPLE Solve $3a + 6 + a = 90$

$$\begin{array}{l} \textcircled{4a} + \textcircled{6} = 90 \\ \quad \quad \downarrow -6 \end{array}$$

$$\frac{4a}{4} = \frac{84}{4}$$

$$a = 21$$

Solve each equation. ~~Check your answer.~~

1. $4n - 2n = 18$

$$2n = 18$$

$$n = 9$$

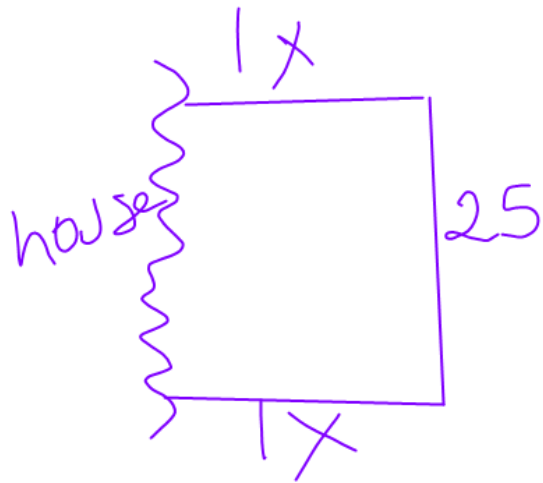
2. $y + y + 2 = 18$

$$2y + 2 = 18$$

$$2y = 16$$

$$y = 8$$

2 EXAMPLE You need to build a rectangular pen in your back yard for your dog. One side of the pen will be against the house. Two sides of the pen have a length of x ft and the width will be 25 ft. What is the greatest length the pen can be if you have 63 ft of fencing?



$$2x + 25 \leq 63$$

$$-25 \quad -25$$

$$2x \leq 38$$

$$x \leq 19 \text{ ft.}$$

Write an equation to model each situation. Solve your equation.

- 10.** Two friends are renting an apartment. They pay the landlord the first month's rent. The landlord also requires them to pay an additional half of a month's rent for a security deposit. The total amount they pay the landlord before moving in is \$1725. What is the monthly rent?

$$x + \frac{1}{2}x = 1,725$$

$$\frac{\frac{1}{2}x}{1.5} = \frac{1,725}{1.5}$$

$$x = \$1,150$$

3 EXAMPLESolve $2(x - 3) = 8$

$$2x - 6 = 8$$

+6 +6

$$2x = 14$$

$$x = 7$$

$$\frac{2 \cdot (x - 3)}{2} = \frac{8}{2}$$

$$x - 3 = 4$$

$$x = 7$$

Solve each equation. ~~Check your answer.~~

$$12. \frac{2(8 + p)}{2} = 22$$

$$8 + p = 11$$

$$p = 3$$

$$13. \frac{5(a - 1)}{5} = \frac{35}{5}$$

$$a - 1 = 7$$

$$a = 8$$

4 EXAMPLE

$$\text{Solve } \frac{3x}{2} + \frac{x}{5} = 17 \cdot 10$$

clear
fractions

$$5 \cancel{10} \cdot \frac{3x}{\cancel{2}} + 2 \cancel{10} \cdot \frac{x}{\cancel{5}} = 170$$

$$15x + 2x = 170$$

$$17x = 170$$

$$x = 10$$

$$21. \left(\frac{a}{7} - \frac{5}{7} \right) = \left(\frac{6}{7} \right)$$

$$a - 5 = 6$$

$$a = 11$$

$$24. \left(\frac{2}{3} + \frac{3k}{4} \right) = \frac{71}{12}$$

$$8 + 9k = 71$$

$$-8 \quad -8$$

$$9k = 63$$

$$k = 7$$

5 EXAMPLESolve $0.6a + 18.65 = 22.85$.

$$-18.65 \quad \downarrow -18.65$$

$$\frac{0.6a = 4.20}{0.6}$$

$$a = 7$$

$$31. \quad 7.8y + 2 = 165.8$$

$$\quad \quad \quad -2 \quad \quad -2$$

$$\frac{7.8y}{7.8} = \frac{163.8}{7.8}$$

$$y = 21$$

HW: pg. 130 #9, 11, 20, 29, 36, 39, 41,
49, 51, 55, 57, 81