

## 4.1 Solving Simple Equations

### Learning Goals:

- You will understand that solving an equation means finding a value for an unknown that makes the statement true
- You will review the "opposite operation" method for solving, and will be able to show all steps appropriately
- You will be able to "check" a solution using the correct format
- You will apply this understanding when solving simple word problems



## Solving Equations

An equation is a mathematical statement that says two expressions are equal. For example  $3x+3=2x-1$  is an equation.

When **solving equations** or finding the **solution** or the **root** you are finding the value of the variable that makes the equation true.

Ex. Solve each equation.

a)  $x + 4 = 13$

b)  $x - 8 = 2$

$$x - \cancel{8} + 8 = 2 + 8$$

$$x = 10$$

c)  $-4 + x = -1$

$$-4 + \cancel{4} + x = -1 + 4$$

$$x = 3$$

d)  $3y = 18$

$$\frac{3y}{3} = \frac{18}{3}$$

$$y = 6$$

e)  $\frac{n}{3} = -4$

$$n = -12$$

f)  $-v = 9$

$$\frac{-v}{-1} = \frac{9}{-1}$$

$$v = -9$$

solve two-step by using SAMDEB

g)  $5x + 25 = 500$

$$5x + \cancel{25} - 25 = 500 - 25$$

$$\frac{5x}{5} = \frac{475}{5}$$

$$x = 95$$

h)  $2x - 7 = 9$

$$2x - \cancel{7} + 7 = 9 + 7$$

$$\frac{2x}{2} = \frac{16}{2}$$

$$x = 8$$

i)  $2k - 7 = -8$

$$2k - \cancel{7} + 7 = -8 + 7$$

$$\frac{2k}{2} = \frac{-1}{2}$$

$$k = -\frac{1}{2}$$

j)  $-9u + 8 = 23$

$$-9u + \cancel{8} - 8 = 23 - 8$$

$$\frac{-9u}{-9} = \frac{15}{-9}$$

$$u = \frac{15}{-9}$$

$$= -\frac{5}{3}$$

k)  $8r - \frac{3}{2} = -15$

$$8r - \frac{3}{2} + \frac{3}{2} = -15 + \frac{3}{2}$$

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

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

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

l)  $-10h - 6 = -\frac{2}{5}$

$$-10h - \cancel{6} + 6 = -\frac{2}{5} + 6$$

$$-10h = -\frac{2}{5} + \frac{30}{5}$$

$$\frac{-10h}{-10} = \frac{28}{5}$$

$$h = \frac{28}{5}$$

$$h = \frac{14}{25}$$

Ex. A student council has raised \$500 in a school spirit fundraising drive. The council decides to use the funds to buy school T-shirts to give away at a pep rally. If the T-shirts cost \$6 each, how many can the student council buy?

a) write an equation

let  $n$  be the number of t-shirts

$$\frac{500}{6} = n \quad \text{or} \quad 6n = 500$$

$$83.3 = n$$

b) The council can buy 83 t-shirts

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Homework, Workbook page 69-70, #7-11