# Rules for Rearranging Equations/ Formulas

1. If you want to move a <u>term</u> from one side of the "=" to the other: do the **opposite operation**.

2. What you do to one side of the "=" you **MUST** do to the other side.

3. Get rid of things farthest away from the variable FIRST! (reverse BEDMAS)

Table of opposite operations...

| + | − | ÷ | × | $\sqrt{}$ | $x^2$ |
|---|---|---|---|-----------|-------|
| − | + | × | ÷ | $x^2$ | $\sqrt{}$ |

$$x^2 = 25$$
$$\sqrt{x^2} = \sqrt{25}$$
$$x = 5$$

Solve.

1. $x + 2 = 5$
   $\quad -2 \quad -2$
   $\quad x = 3$

2. $x - 7 = 9$
   $\quad +7 \quad +7$
   $\quad x = 16$

3. $\dfrac{3x}{3} = \dfrac{15}{3}$
   $\quad x = 5$

4. $\dfrac{x}{4} = 8 \times 4$
   $\quad x = 32$

# Solving Equations

## Solving 2 Step Equations
\* Remember to get rid of things farthest away from the variable FIRST!
(reverse BEDMAS)

1. $5x - 4 = 11$

$+4 \quad +4$

$\dfrac{5x}{5} = \dfrac{15}{5}$

$x = 3$

2. $3m + 6 = 18$

$-6 \quad -6$

$\dfrac{3m}{3} = \dfrac{12}{3}$

$m = 4$

3. $\dfrac{k}{2} + 14 = 16$

$-14 \quad -14$

$2 \times \dfrac{k}{2} = 2 \times 2$

$k = 4$

4. $-p + 6 = 16$

$-6 \quad -6$

$\dfrac{-p}{-1} = \dfrac{10}{-1}$

$r$

5. $\dfrac{h}{3} - 6 = 5$

$\dfrac{h}{3} - 6 + 6 = 5 + 6$

$\times 3 \, \dfrac{h}{3} = 11 \times 3$

$h = 33$

6. $-3u + 14 = -4$

$-14 \quad -14$

$-3u = -18$

$\div (-3) \qquad \div (-3)$

$u = 6$

## How do you "Check" whether your answer in correct?

Sub your answer back into the equation

\# needs to be balanced!

$LS = -3u + 14$

$= -3(6) + 14$

$= -18 + 14$

$= -4$

$RS = -4$

**Solving Equations**

One Step Equation practice. Show your work

1. $x + 7 = 18$

2. $x - 5 = -3$

3. $6x = 24$

4. $\frac{x}{2} = 9$

5. $x + 3 = -5$

6. $x - 5 = 13$

7. $-5x = 30$

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

9. $6 + x = 14$

10. $-2 = -8 + x$

Two Step Equation practice. Show your work.

11. $2x - 5 = 9$

12. $3y + 4 = 16$

13. $7t - 10 = -4$

14. $5m + 28 = 13$

15. $\frac{x}{2} - 3 = 17$

16. $\frac{y}{3} + 6 = 8$

17. $5 + 2x = 13$

18. $3 + \frac{x}{4} = 7$

19. $-4x + 7 = 1$

20. $-12 + \frac{x}{5} = -18$

Solutions:  1) 11    2) 2    3) 4    4) 18    5) -8    6) 18    7) -6    8) 12    9) 8    10) 6
11) 7    12) 4    13) -5    14) -3    15) 40    16) 6    17) 4    18) 16    19) -1    20) -30

**Answer Breakdowns Below**

**Solving Equations**

Solutions...

One Step Equations Practice. Show your work.

1. $x + 7 = 18$
$\quad -7 \quad -7$
$\quad X = 11$

2. $x - 5 = -3$
$\quad +5 \quad +5$
$\quad X = 2$

3. $\dfrac{6x}{6} = \dfrac{24}{6}$
$\quad X = 4$

4. $2 \times \dfrac{x}{2} = 9 \times 2$
$\quad X = 18$

5. $x + 3 = -5$
$\quad -3 \quad -3$
$\quad X = -8$

6. $x - 5 = 13$
$\quad +5 \quad +5$
$\quad X = 18$

7. $\dfrac{-5x}{-5} = \dfrac{30}{-5}$
$\quad X = -6$

8. $(-3) \times \dfrac{x}{-3} = -4 \times (-3)$
$\quad X = 12$

9. $6 + x = 14$
$\quad -6 \quad -6$
$\quad X = 8$

10. $-2 = -8 + x$
$\quad +8 \quad +8$
$\quad 6 = X$

Solutions: 1) 11   2) 2   3) 4   4) 18   5) -8   6) 18   7) -6   8) 12   9) 8   10) 6

**Solving Equations**

<span style="color:red">Solutions...</span>

Two Step Equations Practice. Show your work.

1. $2x - 5 = 9$

$\phantom{2x} +5 \quad +5$

$2x = 14$

$\dfrac{2x}{2} = \dfrac{14}{2}$

$x = 7$

2. $3y + 4 = 16$

$\phantom{3y} -4 \quad -4$

$3x = 12$

$\dfrac{3x}{3} = \dfrac{12}{3}$

$x = 4$

3. $7t - 10 = -45$

$\phantom{7t} +10 \quad +10$

$7t = -35$

$\dfrac{7t}{7} = \dfrac{-35}{7}$

$t = -5$

4. $5m + 28 = 13$

$\phantom{5m} -28 \quad -28$

$5m = -15$

$\dfrac{5m}{5} = \dfrac{-15}{5}$

$m = -3$

5. $\dfrac{x}{2} - 3 = 17$

$\phantom{x} +3 \quad +3$

$\dfrac{x}{2} = 20$

$2 \times \dfrac{x}{2} = 20 \times 2$

$x = 40$

6. $\dfrac{y}{3} + 6 = 8$

$\phantom{y} -6 \quad -6$

$\dfrac{y}{3} = 2$

$3 \times \dfrac{y}{3} = 2 \times 3$

$y = 6$

7. $5 + 2x = 13$

$-5 \phantom{+2x} -5$

$2x = 8$

$\dfrac{2x}{2} = \dfrac{8}{2}$

$x = 4$

8. $3 + \dfrac{x}{4} = 7$

$-3 \phantom{+x} -3$

$\dfrac{x}{4} = 4$

$4 \times \dfrac{x}{4} = 4 \times 4$

$x = 16$

9. $-4x + 7 = 11$

$\phantom{-4x} -7 \quad -7$

$-4x = 4$

$\dfrac{-4x}{-4} = \dfrac{4}{-4}$

$x = -1$

10. $-12 + \dfrac{x}{5} = -18$

$+12 \phantom{+x} +12$

$\dfrac{x}{5} = -6$

$5 \times \dfrac{x}{5} = -6 \times 5$

$x = -30$

Solutions: 1) 7   2) 4   3) -5   4) -3   5) 40   6) 6   7) 4   8) 16   9) -1   10) -30

## Solving Multi-step Equations

* Get all variable terms on the same side
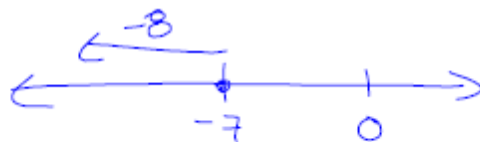
* Combine like terms on the same side of the equal sign

$7x + 8 - 2x = -7$

$$5x + 8 = -7$$
$$\phantom{5x} -8 \quad -8$$
$$\frac{5x}{5} = \frac{-15}{5}$$
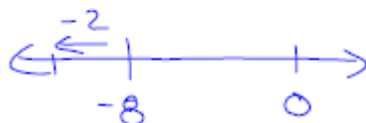$$x = -3$$

$5x + 2 = 3x - 8$

$$-3x \qquad -3x$$
$$2x + 2 = -8$$
$$\phantom{2x} -2 \quad -2$$
$$\frac{2x}{2} = \frac{-10}{2}$$
$$x = -5$$

**Complete the rest of the handout on your own.**
**Check your answers at the bottom of the second page.**

**Solving Equations**

Solve the following. Show all of your work.

1. $-24 = 7x + 18$

2. $-4m + 5 = 15$

3. $-\dfrac{k}{3} - 11 = -20$

4. $10 - 6v = -104$

5. $20 = 4x + 6x$

6. $6 = 1 - 2n + 9$

7. $8x - 2 = -9 + 7x$

8. $a - 5 = -5a + 5$

9. $4m - 4 = 5m$

10. $p - 1 = 5p + 3p - 8$

# Solving Equations

Solve the following. Show all of your work.

**1.**   $-24 = 7x + 18$
$$-18 \qquad -18$$
$$-42 = 7x$$
$$\frac{-42}{7} = \frac{7x}{7}$$
$$-6 = x$$

**2.**   $-4m + 5 = -15$
$$-5 \quad -5$$
$$-4m = -20$$
$$\frac{-4m}{-4} = \frac{-20}{-4}$$
$$m = 5$$

**3.**   $-\frac{k}{3} - 11 = -20$
$$+11 \quad +11$$
$$-\frac{k}{3} = -9$$
$$(-3)\left(-\frac{k}{3}\right) = (-3)(-9)$$
$$k = 27$$

**4.**   $10 - 6v = -104$
$$-10 \qquad -10$$
$$-6v = -114$$
$$\frac{-6v}{-6} = \frac{-114}{-6}$$
$$v = 19$$

**5.**   $20 = 4x + 6x$
$$20 = 10x$$
$$\frac{20}{10} = \frac{10x}{10}$$
$$2 = x$$

**6.**   $6 = 1 - 2n + 9$
$$6 = -2n + 10$$
$$-10 \qquad -10$$
$$-4 = -2n$$
$$\frac{-4}{-2} = \frac{-2n}{-2}$$
$$2 = n$$

**7.**   $8x - 2 = -9 + 7x$
$$-7x \qquad -7x$$
$$x - 2 = -9$$
$$+2 \quad +2$$
$$x = -7$$

**8.**   $a - 5 = -5a + 5$
$$+5a \quad +5a$$
$$6a - 5 = 5$$
$$+5 \quad +5$$
$$6a = 10$$
$$\frac{6a}{6} = \frac{10}{6}$$
$$a = \frac{10}{6}$$
$$a = 5\frac{6}{3}$$

**9.**   $4m - 4 = 5m$
$$-5m \qquad -5m$$
$$-m - 4 = 0$$
$$+4 \quad +4$$
$$-m = 4$$
$$\frac{-m}{-1} = \frac{4}{-1}$$
$$m = -4$$

**10.**   $p - 1 = 5p + 3p - 8$
$$p - 1 = 8p - 8$$
$$-8p \qquad -8p$$
$$-7p - 1 = -8$$
$$+1 \quad +1$$
$$\frac{-7y}{-7} = \frac{-7}{-7}$$
$$y = 1$$

**11.**   $5p - 14 = 8p + 4$
$$-8p \qquad -8p$$
$$-3p - 14 = 4$$
$$+14 \quad +14$$
$$\frac{-3p}{-3} = \frac{18}{-3}$$
$$p = -6$$

**12.**   $p - 3 = -9 + 3p$
$$-3p \qquad -3p$$
$$-2p - 3 = -9$$
$$+3 \quad +3$$
$$\frac{-2p}{-2} = \frac{-6}{-2}$$
$$p = 3$$