

Solving Equations Worksheet

Name: KEY

Solve the following equations. Some of your answers may be extraneous so be sure to check your solutions.

1.) $4x^2 + 2 = 26$

$$4x^2 = 24$$

$$x^2 = 6$$

$$\sqrt{x^2} = \sqrt{6}$$

$$\boxed{x = \pm \sqrt{6}}$$

Check:

$$1 \cdot 21 = 21$$

$$-3 + -7 = -10$$

$$4(\sqrt{6})^2 + 2 = 26$$

$$4(6) + 2 = 26$$

$$24 + 2 = 26 \checkmark$$

$$4(-\sqrt{6})^2 + 2 = 26$$

$$4(6) + 2 = 26$$

$$24 + 2 = 26 \checkmark$$

2.) $x^2 - 10x + 21 = 0$

$$\underline{x^2 - 7x} \quad | \quad \underline{3x + 21} = 0$$

$$x(x-7) - 3(x-7) = 0$$

$$(x-7)(x-3) = 0$$

$$\boxed{x = 7} \quad \boxed{x = 3}$$

Check:

$$(7)^2 - 10(7) + 21 = 0$$

$$49 - 70 + 21 = 0 \checkmark$$

$$(3)^2 - 10(3) + 21 = 0$$

$$9 - 30 + 21 = 0$$

$$4.) (4x-1)(8x+3) = 0$$

$$0 = 0 \checkmark$$

$$4x - 1 = 0$$

$$4x = 1$$

$$\boxed{x = \frac{1}{4}}$$

$$8x + 3 = 0$$

$$8x = -3$$

$$\boxed{x = -\frac{3}{8}}$$

check:

$$(-7+3)^2 - 4 = 12$$

$$(-4)^2 - 4 = 12$$

$$16 - 4 = 12 \checkmark$$

6.) $(x+3)^2 - 4 = 12$

$$(1+3)^2 - 4 = 12$$

$$(x+3)^2 = 16$$

$$(4)^2 - 4 = 12$$

$$\sqrt{(x+3)^2} = \sqrt{16}$$

$$16 - 4 = 12 \checkmark$$

$$x+3 = \pm 4$$

$$x = -3 \pm 4$$

$$\boxed{x = -7} \quad \boxed{x = 1}$$

3.) $\frac{7}{10} \times \frac{9+x}{x}$

$$10(9+x) = 7x$$

$$90 + 10x = 7x$$

$$90 = -3x$$

$$\boxed{x = -30}$$

Check:

$$\frac{7}{10} = \frac{9-30}{-30}$$

$$\frac{7}{10} = \frac{-21}{-30}$$

$$\frac{7}{10} = \frac{7}{10} \checkmark$$

5.) $3x^2 + 13x = -4$

$$3x^2 + 13x + 4 = 0$$

$$\underline{3x^2 + 12x} \quad | \quad \underline{1x + 4} = 0$$

$$3x(x+4) + 1(x+4) = 0$$

$$(x+4)(3x+1) = 0$$

$$\boxed{x = -4} \quad \boxed{x = -\frac{1}{3}}$$

$$3 \cdot 4 = 12$$

$$12 + 1 = 13$$

Check:

$$3(-4)^2 + 13(-4) = -4$$

$$3(16) - 52 = -4$$

$$48 - 52 = -4 \checkmark$$

$$3(-\frac{1}{3})^2 + 13(-\frac{1}{3}) = -4$$

$$3(\frac{1}{9}) - \frac{13}{3} = -4$$

$$\frac{1}{3} - \frac{13}{3} = -4$$

$$-\frac{12}{3} = -4$$

$$-4 = -4 \checkmark$$

7.) $\frac{5x}{10} \times \frac{4}{2}$

$$10x = 40$$

$$\boxed{x = 4}$$

$$\frac{5(4)}{10} = \frac{4}{2}$$

$$\frac{20}{10} = 2$$

$$2 = 2 \checkmark$$

8.) $2x^2 = 162$

$$x^2 = 81$$

$$\sqrt{x^2} = \sqrt{81}$$

$$\boxed{x = \pm 9}$$

Check:

$$2(9)^2 = 162$$

$$2(81) = 162$$

$$162 = 162 \checkmark$$

$$2(-9)^2 = 162$$

$$2(81) = 162$$

$$162 = 162 \checkmark$$

$$9.) (x+6)(2x+6)(3x+6) = 0$$

$$\boxed{x = -6}$$

$$2x+6=0$$

$$2x = -6$$

$$\boxed{x = -3}$$

$$3x+6=0$$

$$3x = -6$$

$$\boxed{x = -2}$$

check:

$$2(-5)^2 + 7(-5) - 15 = 0$$

$$2(25) - 35 - 15 = 0$$

$$50 - 50 = 0 \checkmark$$

$$2\left(\frac{3}{2}\right)^2 + 7\left(\frac{3}{2}\right) - 15 = 0$$

$$2\left(\frac{9}{4}\right) + \frac{21}{2} - 15 = 0$$

$$\frac{9}{2} - \frac{9}{2} = 0 \checkmark$$

$$2 \cdot -15 = -30$$

$$10 + -3 = 7$$

$$10.) 2x^2 + 7x - 15 = 0$$

$$2x^2 + 10x - 3x - 15 = 0$$

$$2x(x+5) - 3(x+5) = 0$$

$$(x+5)(2x-3) = 0$$

$$\boxed{x = -5}$$

$$2x-3=0$$

$$2x = 3$$

$$\boxed{x = \frac{3}{2}}$$

$$11.) 4x - (x-4) = 8 + (x+2)$$

$$4x - x + 4 = 8 + x + 2$$

$$3x + 4 = x + 10$$

$$2x + 4 = 10$$

$$2x = 6$$

$$\boxed{x = 3}$$

check:

$$4(3) - (3-4) = 8 + (3+2)$$

$$12 - (-1) = 8 + 5$$

$$13 = 13 \checkmark$$

$$12.) (x-6)^2 + 2 = 18$$

$$(x-6)^2 = 16$$

$$\sqrt{(x-6)^2} = \sqrt{16}$$

$$x-6 = \pm 4$$

$$x = 6 \pm 4$$

$$\boxed{x = 10}$$

$$\boxed{x = 2}$$

check:

$$(10-6)^2 + 2 = 18$$

$$(4)^2 + 2 = 18$$

$$16 + 2 = 18 \checkmark$$

$$(2-6)^2 + 2 = 18$$

$$(-4)^2 + 2 = 18$$

$$16 + 2 = 18 \checkmark$$