

Solving Quadratic Equations Homework Worksheet

1. $x^2 + 3x = 0$
 $x(x+3) = 0$
 $x_1 = 0 \quad x_2 = -3$

b. $x^2 - 22 = -9x$
 $x^2 + 9x - 22 = 0$
 $(x+11)(x-2) = 0$
 $x_1 = -11 \quad x_2 = 2$

c. $4x^2 - 12x = -9$ $p = 36 \quad s = -12$
 $4x^2 - 12x + 9 = 0$ -6 ± 6
 $(2x-3)(2x-3) = 0$
 $x = \frac{3}{2}$

d. $6x^2 + 9 = -15x$ $p = 6 \quad s = 5$
 $6x^2 + 15x + 9 = 0$ $2, 3$
 $3(2x^2 + 5x + 3) = 0$
 $3(2x+3)(x+1) = 0$
 $x_1 = -\frac{3}{2} \quad x_2 = -1$

e. $-x^2 - 10x - 16 = 0$
 $-(x^2 + 10x + 16) = 0$
 $-(x+8)(x+2) = 0$
 $x_1 = -8 \quad x_2 = -2$

2. $7x^2 - 12x = 9$
 $7x^2 - 12x - 9 = 0$
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $= \frac{-(-12) \pm \sqrt{(-12)^2 - 4(7)(-9)}}{2(7)}$
 $= \frac{12 \pm \sqrt{144 + 252}}{14}$
 $x_1 = \frac{12 + \sqrt{396}}{14} \quad x_2 = \frac{12 - \sqrt{396}}{14}$
 $x_1 \doteq 2.28 \quad x_2 \doteq -0.56$

$$b. \quad 4x^2 = 2.8x + 4.8$$

$$4x^2 - 2.8x - 4.8 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-2.8) \pm \sqrt{(2.8)^2 - 4(4)(-4.8)}}{2(4)}$$

$$= 2.8 \pm \sqrt{7.84 + 76.8}$$

$$x_1 = 2.8 + \sqrt{84.64} \quad x_2 = 2.8 - \sqrt{84.64}$$

$$x_1 = 1.5 \quad x_2 = -0.8$$

$$c. \quad 10x^2 - 7 = 45x$$

$$10x^2 - 45x - 7 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-45) \pm \sqrt{(-45)^2 - 4(10)(-7)}}{2(10)}$$

$$= 4.5 \pm \sqrt{2025 + 280}$$

$$x_1 = 4.5 + \sqrt{2305} \quad x_2 = 4.5 - \sqrt{2305}$$

$$x_1 \approx 4.65 \quad x_2 \approx -0.15$$

$$3a. \frac{x^2}{2} + x + \frac{1}{2} = 0$$

$$2\left(\frac{x^2}{2}\right) + 2(x) + 2\left(\frac{1}{2}\right) = 2(0)$$

$$x^2 + 2x + 1 = 0$$

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

$$x = -1$$

$$b. \frac{x^2}{4} - \frac{x}{3} = \frac{1}{3}$$

$$12\left(\frac{x^2}{4}\right) - 12\left(\frac{x}{3}\right) = 12\left(\frac{1}{3}\right)$$

$$\frac{12x^2}{4} - \frac{12x}{3} = \frac{12}{3}$$

$$3x^2 - 4x = 4$$

$$3x^2 - 4x - 4 = 0$$

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

$$x = -\frac{2}{3} \quad x = 2$$

$$p = -12 \quad s = -4$$

$$-6, 2$$

$$c. \frac{x^2+11}{10} = 2$$

$$10\left(\frac{x^2+11}{10}\right) = 10(2)$$

$$x^2 + 11 = 20$$

$$x^2 = 9$$

$$\sqrt{x^2} = \sqrt{9}$$

$$x = \pm 3$$

$$x_1 = 3 \quad x_2 = -3$$

opp. operation

$$d. 3x^2 - 7 = 30 - 12x^2$$

$$3x^2 + 12x^2 = 30 + 7$$

$$15x^2 = 37$$

$$15 \quad 15$$

$$x^2 = 2.47$$

$$\sqrt{x^2} = \sqrt{2.47}$$

$$x = \pm 1.57$$

$$x_1 = 1.57 \quad x_2 = -1.57$$

