

Name _____

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Sample Problem: Use the Quadratic Formula to find the solution set for $2x^2 + x - 1 = 0$.

$$\text{Sample Solution: } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{1^2 - (4)(2)(1)}}{(2)(2)} = \frac{-1 \pm \sqrt{9}}{4} = \frac{-1 \pm 3}{4}$$

The solution set for $2x^2 + x - 1 = 0$ is $\left\{-1, \frac{1}{2}\right\}$

Problem 1: Use the Quadratic Formula to find the solution set for $-x^2 + 2x + 2 = 0$.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-2 \pm \sqrt{2^2 - 4(-1)(2)}}{2(-1)} = \frac{-2 \pm \sqrt{4+8}}{-2} = \frac{-2 \pm \sqrt{(4)(3)}}{-2} = \frac{-2 \pm 2\sqrt{3}}{-2} = 2 \mp \sqrt{3}$$

The solution set for $-x^2 + 2x + 2 = 0$ is $\{1 + \sqrt{3}, 1 - \sqrt{3}\}$

Problem 2: Use the Quadratic Formula to find the solution set for $16x^2 + 8x - 3 = 0$.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-8 \pm \sqrt{8^2 - 4(16)(-3)}}{2(16)} = \frac{-8 \pm \sqrt{64 + 64(3)}}{2(16)} = \frac{-8 \pm \sqrt{64(1+3)}}{2(16)} = \frac{-8 \pm \sqrt{(64)(4)}}{2(16)}$$

$$\frac{-8 \pm \sqrt{64} \sqrt{4}}{4(8)} = \frac{-8 \pm (8)(2)}{4(8)} = \frac{-1 \pm 2}{4} = \frac{-3}{4} \text{ OR } \frac{1}{4}$$

The solution set for $16x^2 + 8x - 3 = 0$ is $\left\{\frac{-3}{4}, \frac{1}{4}\right\}$

An alternate way to do the computation:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-8 \pm \sqrt{8^2 - 4(16)(-3)}}{2(16)} = \frac{-8 \pm \sqrt{64 + 64(3)}}{2(16)} = \frac{-8 \pm \sqrt{256}}{2(16)} = \frac{-8 \pm 16}{4(8)}$$

$$= \frac{-1 \pm 2}{4} = \frac{-3}{4} \text{ OR } \frac{1}{4}$$

The solution set for $16x^2 + 8x - 3 = 0$ is $\left\{\frac{-3}{4}, \frac{1}{4}\right\}$

Problem 3: Use the Quadratic Formula to find the solution set for $x^2 + 8x - 4 = 0$.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-8 \pm \sqrt{8^2 - 4(1)(-4)}}{(2)(1)} = \frac{-8 \pm \sqrt{64+16}}{2} = \frac{-8 \pm \sqrt{80}}{2} = \frac{-8 \pm \sqrt{(16)(5)}}{2} = \frac{-8 \pm \sqrt{(16)}\sqrt{5}}{2}$$

$$= \frac{-8 \pm 4\sqrt{5}}{2} = -4 \pm 2\sqrt{5}$$

The solution set for $x^2 + 8x - 4 = 0$ is $\{-4 + 2\sqrt{5}, -4 - 2\sqrt{5}\}$