

7.5 Quadratic Formula

Study 7.5 # 1-15, 23, 27, 39, 41,
45, 49-53

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Continue for explanation of solutions to quadratic equations

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7.5 Quadratic Formula

To solve a quadratic equation
in factored form:

$$u v = 0$$

$$u = 0$$

$$v = 0$$

can solve

$$u v = 8$$

$$u = ?$$

$$v = ?$$

can't solve:
infinitely many

$$u u = 9$$

$$u^2 = 9$$

$$u = \pm 3$$

can solve

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7.5 Quadratic Formula

To solve a quadratic equation
in factored form:

So far have
used MPZ

$$u v = 0$$

$$u = 0$$

$$v = 0$$

can solve

Now, will
consider:

$$u u = 9$$

$$u^2 = 9$$

$$u = \pm 3$$

can solve

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7.5 Quadratic Formula

Solve: $x^2 - 16 = 0$

$$(x + 4)(x - 4) = 0$$

$$\begin{array}{l|l} x + 4 = 0 & x - 4 = 0 \\ x = -4 & x = 4 \end{array}$$


$$x^2 = 16$$

$$x = \pm\sqrt{16}$$

$$x = \pm 4$$

$\therefore x = -4$ and $x = 4$ are both solutions.

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7.5 Quadratic Formula

Solve: $x^2 - 19 = 0$

$$x^2 = 19$$

$$x = \pm\sqrt{19}$$

$\therefore x = -\sqrt{19}$ and $x = \sqrt{19}$
are both solutions.

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7.5 Quadratic Formula

$$x^2 - 9 = 8$$

$$x^2 - 17 = 0 \longrightarrow x^2 = 17$$

$$x = \pm\sqrt{17}$$

$$(x + \sqrt{17})(x - \sqrt{17}) = 0$$

$$x + \sqrt{17} = 0 \mid x - \sqrt{17} = 0$$

$$x = -\sqrt{17} \mid x = \sqrt{17}$$

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7.5 Quadratic Formula

$$x^2 + 11x + \underline{\hspace{1cm}} = 20 + \underline{\hspace{1cm}}$$

Solve:

$$x^2 + 11x - 20 = 0$$

prime trinomial, cannot factor
BUT, can use APE to put into form:

$$u^2 = n$$

$$u = \pm\sqrt{n}$$

$$\text{Find: } \frac{b}{2a} = \frac{11}{2(1)} = \frac{11}{2}$$

$$\text{Then square: } \left[\frac{11}{2} \right]^2$$

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7.5 Quadratic Formula

Solve:

$$x^2 + 11x = 20$$

$$u^2 = n$$
$$u = \pm\sqrt{n}$$

$$x^2 + 11x + \left[\frac{11}{2}\right]^2 = 20 + \left[\frac{11}{2}\right]^2$$

$$\left(x + \frac{11}{2}\right)^2 = 20 + \left[\frac{11}{2}\right]^2$$

$$x + \frac{11}{2} = \pm\sqrt{20 + \left[\frac{11}{2}\right]^2}$$

$$x = -\frac{11}{2} \pm \sqrt{20 + \left[\frac{11}{2}\right]^2}$$

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7.5 Quadratic Formula

Solve: $ax^2 + bx + c = 0$

Quadratic Formula

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

ALWAYS:

1. Write formula.
2. Write values for a, b, and c.

$$x^2 + 11x - 20 = 0$$

$$a = 1, b = 11, c = -20$$

$$x = \frac{-11 \pm \sqrt{11^2 - 4(1)(-20)}}{2(1)}$$

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