Slide 1

Section 9-4
Factoring to Solve
Quadratic Equations

Students will be able to solve quadratic equations by factoring.

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Slide 2

How would we solve $x^2 - 10 = 0$?

$$x^2 - 10 = 0$$
$$+10 \quad +10$$
$$\sqrt{x^2} = \sqrt{10}$$

$$x^2 - 10 = 0$$
$$x^2 + \boxed{} - 10 = 0$$
$$x \approx \pm 3.2$$

This method works when the only variable is x^2. If there is a _b_ term we have to use other methods.

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Slide 3

You can solve quadratic equations using the zero-product property.

For all real numbers a and b, if ab = 0, then a = 0 or b = 0.

Example:

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

$$x + 3 = 0$$
$$-3 \quad -3$$
$$\boxed{x = -3}$$

$$x - 1 = 0$$
$$+1 \quad +1$$
$$\boxed{x = 1}$$

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Slide 4

What are the solutions?

1. $(2x + 3)(x - 4) = 0$

$$2x + 3 = 0 \qquad x - 4 = 0$$
$$-3 \quad -3 \qquad +4 \quad +4$$
$$\boxed{x = -\tfrac{3}{2}} \quad 2x = -3 \qquad \boxed{x = 4}$$

2. $(7n - 2)(5n - 4) = 0$

3. $2x(x + 5)(x - 4) = 0$

$$\tfrac{2x}{2} = \tfrac{0}{2} \qquad x = -5, 4, 0$$

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Slide 5

Many times, you will have to find the factors first.

Solve:
$m^2 - 5m - 14 = 0$

$$(m + 2)(m - 7) = 0$$
$$m = -2, 7$$

$$7^2 - 5(7) - 14$$
$$49 - 35 - 14 = 0$$

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Slide 6

Solve:

$2a^2 - 15a + 18 = 0$
$2(\qquad\qquad)$

$$(2a - 3)(a - 6) = 0$$

$$2a - 3 = 0 \qquad \boxed{a = 6}$$
$$+3 \quad +3$$
$$\tfrac{2a}{2} = \tfrac{3}{2}$$
$$\boxed{a = \tfrac{3}{2}}$$

18	
1	18
2	9
3	6

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Before solving a quadratic, you must make sure that it is in standard form first.
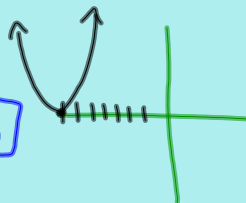
Solve:
$x^2 + 14x = -49$

$$+49 \quad +49$$
$$x^2 + 14x + 49 = 0$$
$$(x + 7)(x + 7) = 0$$
$$x = -7$$

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Solve:
$$50 = 50$$
$2x^2 = 10x$
$$-10x \quad -10x$$

$$2x^2 - 10x = 0$$
$$2x(x - 5) = 0$$
$$\frac{2x}{2} = \frac{0}{2} \qquad x = 5$$
$$x = 0$$

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