

### Warm Up --Block week 15

1. Solve by completing the square.

$$2x^2 + 6x + 1 = 0$$

$$\frac{2x^2}{2} + \frac{6x}{2} = \frac{-1}{2}$$

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

$$\left(x + \frac{3}{2}\right)^2 = \frac{7}{4}$$

$$x + \frac{3}{2} = \pm \sqrt{\frac{7}{4}}$$

$$x = \frac{-3 \pm \sqrt{7}}{2}$$

3. Find all roots.

$$2x^3 - 6x^2 + 12x = 0$$

$$2x(x^2 - 3x + 6) = 0$$

$$2x = 0 \text{ or } x^2 - 3x + 6 = 0$$

$$x = 0 \text{ or } x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(6)}}{2(1)}$$

$$= \frac{3 \pm \sqrt{9 - 24}}{2} = \frac{3 \pm \sqrt{-15}}{2}$$

$$x = \frac{3 \pm i\sqrt{15}}{2} \text{ or } x = 0$$

2. Solve by factoring and the zero-product property.

$$x^2 + 6x + 5 = 0$$

$$(x + 5)(x + 1) = 0$$

$$x + 5 = 0 \text{ or } x + 1 = 0$$

$$x = -5 \text{ or } x = -1$$

4. Divide using synthetic division.

$$(x^3 - 25x + 28) \div (x - 4)$$

$$x^2 + 4x - 9 - \frac{8}{x - 4}$$