

Bell Ringer: Factor completely; then find the solutions.

$$4x^3 + 4x^2 - 80x = 0$$

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$$4x^3 + 4x^2 - 80x = 0$$

Factor out $4x$ $4x(x^2 + x - 20) = 0$

Factor $a=1$
method $4x(x+5)(x-4) = 0$

$$x = 0, -5, 4$$

Factoring with the Distributive Property - Grouping Terms

Grouping Terms

- if given 4 terms, group into 2 groups of 2 and then factor completely.
- look for a GCF of each group.

MUST FACTOR COMPLETELY

Factor completely using regrouping, then state the solutions.

$$1) \quad x^3 + 4x^2 + 6x + 24 = 0$$

Factor completely using regrouping, then state the solutions.

$$1) x^3 + 4x^2 + 6x + 24 = 0$$

$$(x^3 + 4x^2) + (6x + 24) \quad \text{Group}$$

$$x^2(x + 4) + 6(x + 4) \quad \text{Factor out GCF}$$

$$(x + 4)(x^2 + 6) = 0 \quad \text{Regroup with GCF}$$

$$x = -4$$

Solve

note $x^2 + 6 = 0$ does not
have any solutions

Factor completely using regrouping, then state the solutions.

$$2) \quad x^3 + 2x^2 + 3x + 6 = 0$$

Factor completely using regrouping, then state the solutions.

$$2) \quad x^3 + 2x^2 + 3x + 6 = 0$$

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

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

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

$$x = -2$$

Factor completely using regrouping, then state the solutions.

$$3) \quad x^3 - 2x^2 - 9x + 18 = 0$$

Factor completely using regrouping, then state the solutions.

$$3) x^3 - 2x^2 - 9x + 18 = 0$$

$$(x^3 - 2x^2)(-9x + 18) = 0$$

$$x^2(x - 2) - 9(x - 2) = 0 \text{ watch your negatives}$$

$$(x - 2)(x^2 - 9) = 0 \text{ difference of two squares}$$

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

$$x = 2, -3, 3$$

Factor completely using regrouping, then state the solutions.

$$4) \quad x^3 + 2x^2 - 36x - 72 = 0$$

Factor completely using regrouping, then state the solutions.

$$4) \quad x^3 + 2x^2 - 36x - 72 = 0$$

$$(x^3 + 2x^2)(-36x - 72) = 0$$

$$x^2(x+2) - 36(x+2) = 0$$

$$(x+2)(x^2 - 36) = 0$$

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

$$x = -2, -6, 6$$