Lesson 3.3: Solving by Factoring

How To Solve by Factoring

- 1. Set the equation equal to 0.
- 2. Factor as much as possible
- 3. Set each factor equal to 0 and solve for x.

Use the Quadratic Formula when you have a

quadratic (that doesn't factor) in the form of $ax^2 + bx + c$

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

How to Know When to Use What Method

- 1. Grouping Method: 4 terms
- 2. <u>Diagram/Bottoms Up</u>: 3 terms (highest exponent is twice as big as middle term's exponent)
- 3. Perfect Squares: 2 terms
- 4: Perfect cubes: 2 terms
- 5. Synthetic Division: Every other method fails

9)
$$x^4 + 5x^3 + 4x^2 = 0$$

1 Done

(2)
$$\chi^2 (\chi^2 + 5\chi + 4) = 0$$

$$\frac{\chi^{2}(x+4)(x+1)=0}{\chi^{2}}$$

$$X^{2}=0 \qquad X+Y=0$$

7)
$$2x^3 + 3x^2 - 6x = 9$$

1)
$$2x^3 + 3x^2 - 6x - 9 = 0$$

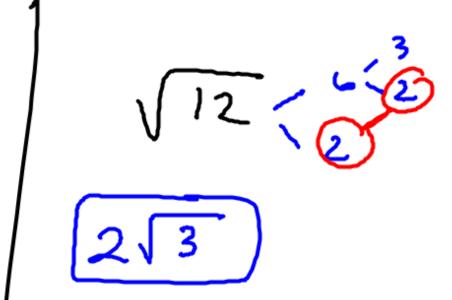
 $\chi^2(2x+3) - 3(2x+3)$

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

$$x^2 - 3 = 0$$

$$+3 +3$$

5 implify



10)
$$3x^4 - 5x^2 - 2 = 0$$

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

$$(x^2-2)(3x^2+1)=0$$

$$\frac{3x^2}{3} = \frac{1}{3}$$

$$x = \pm \sqrt{-\frac{1}{3}} = \pm i\sqrt{\frac{1}{3}}$$

11)
$$x^3 + 7x^2 + 6 = -14x$$

 $+14x$
 $+14x$

$$(2) \quad \chi^{2}(\underline{x+7}) + 2 \quad (7x+3)$$

$$-3 \quad 1 \quad 7 \quad 14 \quad 6$$

$$-3 \quad -12 \quad -6$$

$$(x+3)(x^2+4x+2)=0$$

$$X = -\frac{4 \pm \sqrt{4^2 - 4(1)(2)}}{2(1)}$$

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

$$X = -\frac{4 \pm \sqrt{8}}{4}$$

$$x = -\frac{4 \pm 2\sqrt{2}}{2}$$
 $= -2 \pm \sqrt{2}$

19)
$$\chi^{5} = x^{6} + x^{5} + 8x^{3}$$

(i) $0 = x^{6} + 8x^{3}$

2)
$$0 = x^{3}(x^{3} + 8)$$

 $A = \sqrt[3]{x^{3}} = x$
 $b = \sqrt[3]{8} = 2$

$$X^3(X+2)(x^2-2x+4)=0$$

$$\begin{pmatrix} 3 \\ X^3 = 0 \end{pmatrix}$$

03+b3: (a+b) (a2-ab+ b2)