Algebra 1   8.8
Factor binomials that are the difference of squares
Use the difference of squares to solve equations
difference
factor
solve
zero product property
whiteboards

Easter Egg scavenger hunt (if time)

$$x^2 - 81$$

$$(x + 9)(x - 9)$$ WB 8.8 skills

$(p. 113)$ 1-23 odd mislabeled

Quiz 8.6-8.7

1) $a^2 - 4$ (8.5)

KeyConcept Difference of Squares

Symbols $a^2 - b^2 = (a + b)(a - b)$ or $(a - b)(a + b)$

Examples $x^2 - 25 = (x + 5)(x - 5)$ or $(x - 5)(x + 5)$

$t^2 - 64 = (t + 8)(t - 8)$ or $(t - 8)(t + 8)$

Hint: might be GCF too...

c. $\dfrac{27g^3}{3g} - \dfrac{3g}{3g}$

$$3g\left(9g^2 - 1 \right)$$

$$3g\left(3g+1\right)\left(3g-1\right)$$

GCF
Is the first thing something squared?
Is the second thing something squared?
Is it a difference?

Might need to rearrange...

b. $625 - x^4$

$\uparrow \quad \uparrow$

$25 \quad x^2$

$(25 + x^2)(25 - x^2)$

$(25 + x^2)(5 + x)(5 - x)$

How do you know when you are finished factoring? Examine your answer. Is there another d.o.s.?

Whiteboards

$$\begin{array}{r} x + 5 \\ x + 5 \\ \hline 5x + 25 \\ x^2 + 5x \\ \hline x^2 + 10x + 25 \end{array}$$

2A. $y^4 - 1$

$y^2 \quad 1$

$(y^2 + 1)(y^2 - 1)$

$(y^2 + 1)(y + 1)(y - 1)$

2B. $4a^4 - b^4$

$2a^2 \quad b^2$

$(2a^2 + b^2)(2a^2 - b^2)$

Example 3 Apply Different Techniques

Factor each polynomial.

a. $5x^5 - 45x$

$$\frac{}{5x} \quad \frac{}{5y}$$

$$5x(x^4 \quad - \quad 9 \quad)$$
$$\downarrow$$
$$x^2 \qquad 3$$

$$5x(x^2 + 3)(x^2 - 3)$$

What are some different kinds of factoring?
(Use everything that you know...)

1. GCF
2. Factor by grouping
3. X-factor
4. Leading coefficient (factor pairs)
5. Difference of squares

b. $7x^3 + 21x^2 - 7x - 21$

3C. $2m^3 + m^2 - 50m - 25$

3D. $r^3 + 6r^2 + 11r + 66$

What if it is an equation?

Scavenger hunt...

Zero product property

4. Which are the solutions of $18x^3 = 50x$?

$-50x - 50x$

$$\frac{18x^3}{2x} - \frac{50x}{2x} = 0$$

$$2x(9x^2 - 25) = 0$$

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

$$\frac{2x}{2} = \frac{0}{2}$$

$3x+5=0$
$\quad -5 \quad -5$

$$\frac{3x}{3} = \frac{-5}{3}$$

$3x-5=0$
$\quad +5 \quad +5$

$$\frac{3x}{3} = \frac{5}{3}$$

$x=0$

$x = -\frac{5}{3}$

$x = \frac{5}{3}$

In the equation $y = x^2 - \frac{9}{16}$, which is a value of x when $y = 0$?