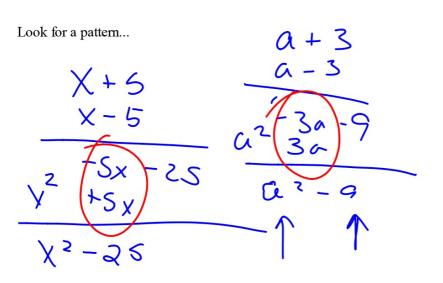Algebra 1   8.8
Factor binomials that are the difference of squares
Use the difference of squares to solve equations
difference
factor
solve
whiteboards

Quiz 8.6-8.7

Look for a pattern...

$$x + 5$$
$$x - 5$$

$$x^2 \quad \boxed{-5x} \quad -25$$
$$\boxed{+5x}$$

$$x^2 - 25$$

$$a + 3$$
$$a - 3$$

$$a^2 \quad \boxed{-3a \quad -9}$$
$$\boxed{3a}$$

$$a^2 - 9$$

$\uparrow$ $\uparrow$

$$\boxed{x^2 - 49}$$

$$(x - 7)(x + 7)$$

$$x^2 - 81)$$

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 $(t - 8)(t + 8)$

$$-25$$
$$-5 \quad 5$$
$$0$$

$$-64$$
$$8 \quad -8$$
$$0$$

Is the first thing something squared?
Is the second thing something squared?
Are they subtracted?

$x^2 - 49$ $(x+7)(x-7)$

$n^2 \boxed{+} 64$ $=$

$x^3 - 36 \cdot$ $=$

$4a^2 - 16$ $(2a+4)(2a-4)$

Example 1 Factor Differences of Squares

Factor each polynomial.

a. $16h^2 - 9a^2$

$(4h + 3a)(4h - 3a)$

Is the first thing something squared?
Is the second thing something squared?
Are they subtracted?

b. $121 - 4b^2$

$$(11 + 2b)(11 - 2b)$$

Always check for GCF first

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

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

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

GuidedPractice

1A. $81 - c^2$

$(9 + c)(9 - c)$

1B. $64g^2 - h^2$

$(8g - h)(8g + h)$

GCF?

1C. $\dfrac{9x^3}{x} - \dfrac{4x}{x}$

$x(9x^2 - 4)$

$\downarrow$

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

15-43 odds
p.518

Can it be rearranged?

1D. $-4y^3 + 9y$

$9y - 4y^3$

$y(9 - 4y^2)$

$y(3 - 2y)(3 + 2y)$

When is it finished? Check your answer...can anything be factored again? Watch out for DOS.

Example 2 Apply a Technique More than Once

Factor each polynomial.
a. $b^4 - 16$

esp. diff of squares...
easy to overlook

b. $625 - x^4$

GuidedPractice

2A. $y^4 - 1$

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

2C. $81 - x^4$　　　　　　　　　　　　　　　　　　　**2D.** $16y^4 - 1$