Announcements

Polynomials Tests were returned to you on Monday. Find them in your email. Test corrections are due next Monday.

Exponents Test 2… we are still waiting...

Factoring Test is on Monday

HF Chapters 13-16 will be due on Monday, but remember you can always work ahead!

Unit Map - Factoring

~~Friday - Factoring by Grouping~~
~~Monday - Factoring Trinomials x2+bx+c~~
~~Tuesday - Factoring Trinomials ax2+bx+c~~
Wednesday - Factoring Special Cases
Thursday - Hidden Figures Reading Day with Mrs. Mitchell to substitute
Friday - Factoring Review Monday - Factoring Test

Let’s Talk About Yesterday...

HERE

Check Yesterday's Homework (Page 509 #20, 21, 34-46 even, 49, 51.)

Special Cases of Factoring

3/6/2019

Watch this video

https://www.youtube.com/watch?v=aM1qf2QN8YE

Any trinomial of the form $a^2 + 2ab + b^2$ or $a^2 - 2ab + b^2$ is a **perfect-square trinomial** because it is the result of squaring a binomial. Reading the equations above from right to left gives you rules for factoring perfect-square trinomials.

Examples of perfect square trinomials:

1) $x^2 - 12x + 36 \rightarrow$ notice that you could write this as $x^2 - 2(1)(6)x + 6^2$
2) $4x^2 + 20x + 25 \rightarrow$ notice that you could write this as $(2x)^2 + 2(2)(5)x + 5^2$

take note

Key Concept Factoring Perfect-Square Trinomials

Algebra For every real number a and b:

$$a^2 + 2ab + b^2 = (a + b)(a + b) = (a + b)^2$$

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

Examples $x^2 + 8x + 16 = (x + 4)(x + 4) = (x + 4)^2$

$4n^2 - 12n + 9 = (2n - 3)(2n - 3) = (2n - 3)^2$

Problem 1 Factoring a Perfect-Square Trinomial

What is the factored form of $x^2 - 12x + 36$?

$x^2 - 12x + 36 = x^2 - 12x + 6^2$ Write the last term as a square.

$= x^2 - 2(x)(6) + 6^2$ Does middle term equal $-2ab$? $-12x = -2(x)(6)$ ✔

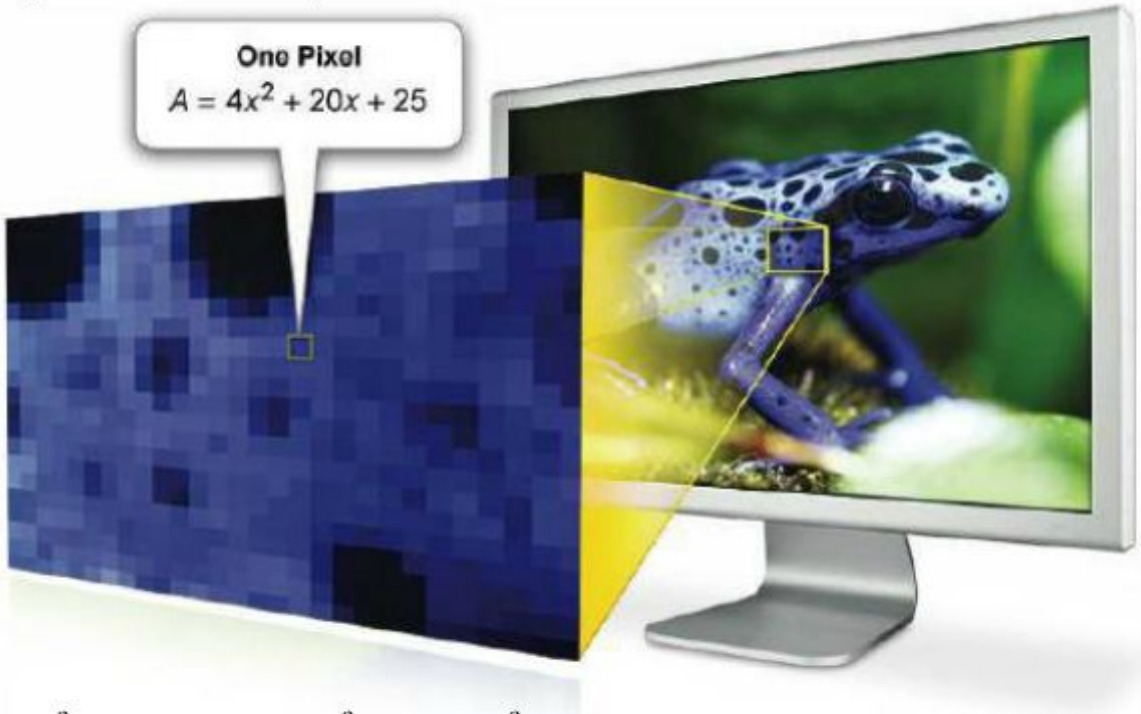
$= (x - 6)^2$ Write as the square of a binomial.

Got It? **1.** What is the factored form of each expression?

a. $x^2 + 6x + 9$

b. $x^2 - 14x + 49$

Computers Digital images are composed of thousands of tiny pixels rendered as squares, as shown below. Suppose the area of a pixel is $4x^2 + 20x + 25$. What is the length of one side of the pixel?



$$4x^2 + 20x + 25 = (2x)^2 + 20x + 5^2$$ Write first and last terms as squares.

$$= (2x)^2 + 2(2x)(5) + 5^2$$ Does middle term equal $2ab$? $20x = 2(2x)(5)$ ✔

$$= (2x + 5)^2$$ Write as the square of a binomial.

The length of one side of the pixel is $2x + 5$.

Got It? **2.** You are building a square patio. The area of the patio is $16m^2 - 72m + 81$. What is the length of one side of the patio?

Watch this video

https://www.youtube.com/watch?v=r8n3Q5Oh1D8

Recall from Lesson 8-4 that $(a + b)(a - b) = a^2 - b^2$. So you can factor a **difference of two squares**, $a^2 - b^2$, as $(a + b)(a - b)$.

take note

Key Concept Factoring a Difference of Two Squares

Algebra For all real numbers a and b:

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

Examples $x^2 - 64 = (x + 8)(x - 8)$

$$25x^2 - 36 = (5x + 6)(5x - 6)$$

Problem 3 Factoring a Difference of Two Squares

What is the factored form of $z^2 - 9$?

Think	Write
Rewrite 9 as a square.	$z^2 - 9 = z^2 - 3^2$
Factor using the rule for a difference of two squares.	$= (z + 3)(z - 3)$
Check your answer by multiplying the factored form.	$(z + 3)(z - 3) = z^2 - 3z + 3z - 9$ $= z^2 - 9$ ✔

Got It? **3.** What is the factored form of each expression?

a. $v^2 - 100$ **b.** $s^2 - 16$

Problem 4 Factoring a Difference of Two Squares

What is the factored form of $16x^2 - 81$?

$16x^2 - 81 = (4x)^2 - 9^2$ Write each term as a square.

$= (4x + 9)(4x - 9)$ Use the rule for the difference of squares.

Got It? **4. a.** What is the factored form of $25d^2 - 64$?

b. Reasoning The expression $25d^2 + 64$ contains two perfect squares. Can you use the method in Problem 4 to factor it? Explain your reasoning.

When you factor out the GCF of a polynomial, sometimes the expression that remains is a perfect-square trinomial or the difference of two squares. You can then factor this expression further using the rules from this lesson.

Problem 5 Factoring Out a Common Factor

What is the factored form of $24g^2 - 6$?

$$24g^2 - 6 = 6(4g^2 - 1)$$ Factor out the GCF, 6.

$$= 6[(2g)^2 - 1^2]$$ Write the difference as $a^2 - b^2$.

$$= 6(2g + 1)(2g - 1)$$ Use the rule for the difference of squares.

Got It? **5.** What is the factored form of each expression?

a. $12t^2 - 48$ **b.** $12x^2 + 12x + 3$

Lesson Check

Do you know HOW?

Factor each expression.

1. $y^2 - 16y + 64$
2. $9q^2 + 12q + 4$
3. $p^2 - 36$
4. The area of a square is $36w^2 + 60w + 25$. What is the side length of the square?

Do you UNDERSTAND?

Identify the rule you would use to factor each expression.

5. $81r^2 - 90r + 25$
6. $k^2 + 12k + 36$
7. $9h^2 - 64$
8. **Reasoning** Explain how to determine whether a binomial is a difference of two squares.

Bonus Quiz

Pop quiz on factoring - it will only help your grade!

Your grade will go into powerschool, but I'll exempt it if it brings your grade down.

HERE to see quiz questions

HERE to submit quiz answers

When you finish, preview the lesson for today online.