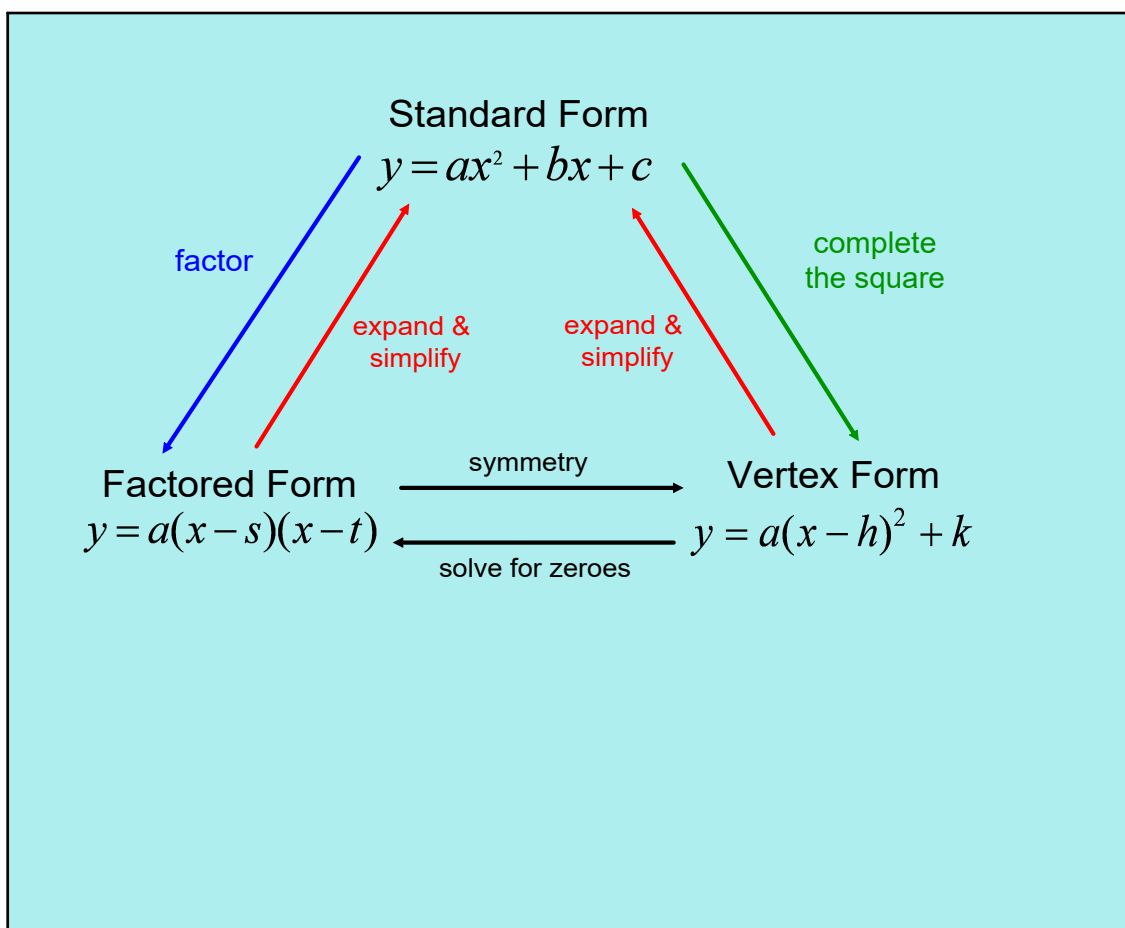


Feb 6/2019

MCR3U: Review of MPM2D

Factoring Quadratic Relations

Jan 31-2:27 PM



Feb 2-6:19 PM

1. Common Factors

* always look for common factors first!

Look for the greatest common factor of the coefficients and the GCF of the variables.

Ex. Factor: $8x^3 - 6x^2y^2 + 4x^2y$

The GCF of 8, 6, and 4 is 2.

The GCF of x^3 , x^2y^2 , and x^2y is x^2y^0 .

8: ~~8~~, 4, 2, 1
6: ~~6~~, ~~3~~, 2, 1
4: ~~4~~, 2, 1

$$8x^3 - 6x^2y^2 + 4x^2y = 2x^2 \left(\frac{8x^3}{2x^2} - \frac{6x^2y^2}{2x^2} + \frac{4x^2y}{2x^2} \right)$$

$$= 2x^2(4x - 3y^2 + 2y)$$

x^3y^0

Mar 26-8:24 AM

2. Common Factors by Grouping

Some polynomials do not have common factors in all terms. They can sometimes be factored by grouping terms with common factors.

Ex. Factor: $ac + bc + ad + bd$

$$= c(a+b) + d(a+b)$$

$$\text{let } q = (a+b)$$

$$= cq + dq$$

$$= q(c+d)$$

$$= (a+b)(c+d)$$

Mar 26-8:24 AM

3. Factoring Trinomials ($ax^2 + bx + c$)

(a) Using Alge-tiles, or an Area Model

Model the expression as an area. The tiles must form a rectangle (or square). The lengths of the sides are factors.

(b) Algebraically

What is the relationship between the coefficients of each term in the expression? Use this information to decompose the middle term into two pieces, then factor by grouping.

Mar 26-8:24 AM

3. Factoring Trinomials ($ax^2 + bx + c$)Ex. Factor: $x^2 - 5x + 6$

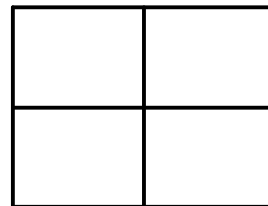
algebraically

Multiply: $+6$ Sum: -5
 Add: -5 Product: $+6$
 Numbers: Integers:
 $-3, -2$

$$\begin{aligned}
 & x^2 - 3x - 2x + 6 \\
 & = x(x-3) - 2(x-3) \\
 & = (x-3)(x-2)
 \end{aligned}$$

$\rightarrow xq - 2q$
 $= q(x-2)$

using an area model



Feb 1-7:13 PM

Ex. Factor $3x^2 + 7x + 2$ algebraically

$$\underline{3x^2 + x} + \underline{6x + 2}$$

$$= x(3x+1) + 2(3x+1)$$

$$= (3x+1)(x+2)$$

$$M: 3 \times 2 = 6$$

$$A: 7$$

$$N: 1, 6$$

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4. Factoring Special Quadratics (by patterns)

Perfect Squares: $a^2 + 2ab + b^2 = (a+b)^2$

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

Difference of Squares: $a^2 - b^2 = (a-b)(a+b)$

(a) $25d^2 - 144$

$$= (5d)^2 - (12)^2$$

$$= (5d-12)(5d+12)$$

(c) $18p^2q - 60pq + 50q$

$$= 2q(9p^2 - 30p + 25)$$

$$= 2q(3p-5)^2$$

(b) $16x^2 + 24xy + 9y^2$

$$= (4x)^2 + 24xy + (3y)^2$$

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

(d) $98a^2 - 32b^2$

$$= 2(49a^2 - 16b^2)$$

$$= 2(7a-4b)(7a+4b)$$

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Homework:

p.3 # 4odd, 5odd, 6odd

a e a
g

$$4(a) \quad 7t^2 - 14t^3$$

$$= 7t^2(1 - 2t)$$

$$\frac{t^2}{t^2} = 1 \checkmark$$

$$\frac{t^3}{t^2} = t \checkmark$$

$$\frac{t^2}{t^3} = \frac{1}{t} \times$$

$$5(e) \quad w^2 - 81$$

$$= 1w^2 + 0w - 81$$

$$ax^2 + bx + c$$

$$w^2 + 0w - 81$$

$$= \underline{w^2 + 9w} - \underline{9w - 81} \quad M: -81$$

$$A: 0$$

$$= w(w+9) - 9(w-9) \quad N: +9, -9$$

$$= (w+9)(w-9)$$

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6ag

$$(a) \quad 2x^2 + 7x + 3 \quad M: 6$$

$$= 2x^2 + x + 6x + 3 \quad A: 7$$

$$N: 1, 6$$

$$= x(2x+1) + 3(2x+1)$$

$$= (2x+1)(x+3)$$

$$(g) \quad 9a^2 - 16 \quad M: -144$$

$$= 9a^2 + 0a - 16 \quad A: 0$$

$$N: 12, -12$$

$$= 9a^2 + 12a - 12a - 16$$

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

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

$$\text{OR } 9a^2 - 16 = (3a)^2 - (4)^2$$

$$\rightarrow = (3a-4)(3a+4)$$

Feb 7-12:44 PM