August 27, 2012

P.4 P.5

Topic: Polynomials and Factoring

Question: Explain how to factor a trinomial that looks like ax^2+bx+c.

Warm-Up

a.) $(-17x^3+4x^2-11x-5)+(16x^3-3x^2+3x-15)$

$-17x^3+16x^3+4x^2-3x^2-11x+3x-5-15$

$\boxed{-x^3+x^2-8x-20}$

b.) $(2x+3)(x^2+4x+5)$

$2x\cdot x^2+2x\cdot 4x+2x\cdot 5+3\cdot x^2+3\cdot 4x+3\cdot 5$

$2x^3+8x^2+10x+3x^2+12x+15$

$\boxed{2x^3+11x^2+22x+15}$

Factor

c.) $10x^3-4x^2$

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

$10x^3-4x^2$

$x(10x^2-4x)$

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

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

d.) $x^2+13x+40$

1	40
2	20
4	10
5	8

40

5 8

13

$x^2+13x+40$

$x^2+5x+8x+40$

$(x^2+5x)+(8x+40)$

$x(x+5)+8(x+5)$

$\boxed{(x+5)(x+8)}$

Example 1.) Simplify

$(3x+y+1)^2$

$(3x+y+1)(3x+y+1)$

5^2

$5 \cdot 5$

$3x \cdot 3x + 3x \cdot y + 3x \cdot 1 + y \cdot 3x + y \cdot y + y \cdot 1 + 1 \cdot 3x + 1 \cdot y + 1 \cdot 1$

$9x^2 + 3xy + 3x + 3xy + y^2 + y + 3x + y + 1$

$\boxed{9x^2 + 6xy + 6x + y^2 + 2y + 1}$

Example 2.) Factor

a.) $x^3 + 4x^2 + 3x + 12$

$(x^3 + 4x^2) + (3x + 12)$

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

$\boxed{(x^2+3)(x+4)}$

$x^2y + 3y$

$(x^2+3)y$

b.) $x^3 + 5x^2 - 2x - 10$

$(x^3 + 5x^2) + (-2x + -10)$

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

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

$\boxed{(x^2-2)(x+5)}$

$(x^3 + 5x^2)(-2x - 10)$

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

Example 3. Factor

a.) $8x^2 - 10x - 3$

$8x^2 \cdot -3$

$-24x^2$

$-12x \quad 2x$

$-10x$

$-12x \quad 2x$

$8x^2 - 12x + 2x - 3$

$(8x^2 - 12x) + (2x - 3)$

$4x(2x - 3) + 1(2x - 3)$

$\boxed{(4x+1)(2x-3)}$

b.) $6x^2 + 19x - 7$

$6x^2 \cdot (-7)$

$-42x^2$

$21x \quad -2x$

$19x$

$6x^2 + 21x - 2x - 7$

$(6x^2 + 21x)(-2x - 7)$

$3x(2x + 7) - 1(2x + 7)$

$\boxed{(3x-1)(2x+7)}$

$42x \quad -1x$

$-3x \quad 14x$

$21x \quad -2x$

Example 4. Factor

a.) $2x^2 - 7xy + 3y^2$

$2x^2 \cdot 3y^2$

$6x^2y^2$

$-6xy \quad -1xy$

$-7xy$

$2x^2 - 6xy - 1xy + 3y^2$

$(2x^2 - 6xy)(-1xy + 3y^2)$

$2x(x - 3y) - 1y(x - 3y)$

$\boxed{(2x-y)(x-3y)}$

b.) $3x^2 - 13xy + 4y^2$

Assignment Due Wednesday

P.4) 11–107 primes

P.5) 1–37 primes