Section 5.4: Multiplying Binomials

Tuesday, October 29, 2013
9:10 AM

the FOIL method:

first last

$$(y+3)(y-7)$$

inside

outside

$$(y+3)(y-7) = y^2 - 7y + 3y - 21$$
$$= y^2 - 4y - 21$$

expand:

$$(3y^8 - 4)(2y^8 + 5) = 6y^{16} + 15y^8 - 8y^8 - 20$$
$$= 6y^{16} + 7y^8 - 20$$

$$(x^2 + 1)(x^3 - 5) = x^5 - 5x^2 + x^3 - 5$$
$$= x^5 + x^3 - 5x^2 - 5$$

square of a binomial:

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

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

expand:

$$(2x+5)^2 = 4x^2 + 20x + 25$$

$$(x-7)^2 = x^2 - 14x + 49$$

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difference of squares:

these will always cancel

$$\underbrace{(a-b)(a+b)}_{\text{product of a sum and a difference}} = a^2 \overbrace{+ab - ab}^{\text{these will always cancel}} - b^2$$

$$= \underbrace{a^2 - b^2}_{\text{difference of squares}}$$

product of a sum and a difference

difference of squares

find the product:

$$(3w-2)(3w+2) = 9w^2 - 4$$

$$(8z^4+2)(8z^4-2) = 64z^8 - 4$$

$$(3xy+9)(3xy-9) = 9x^2y^2 - 81$$

$$(4y^2-1)(4y^2+1) = 16y^4 - 1$$

$$(6w^4+5y^3)(6w^4-5y^3) = 36w^8 - 25y^6$$

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simplify:

$$\frac{(x+h)^2 - x^2}{h} = \frac{x^2 + 2xh + h^2 - x^2}{h}$$

$$= \frac{2xh + h^2}{h}$$

$$= \frac{h(2x+h)}{h}$$

$$= 2x + h$$

$$(4x^{a-1} + 3y^{b+5})(x^{2a-3} - 2y^{4-b})$$

$$= 4x^{3a-4} - 8x^{a-1}y^{4-b} + 3x^{2a-3}y^{b+5} - 6y^{9}$$

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note: omit higher powers like $(x+3)^5$

(we do these in Math 173 with

much better methods)