

Section 5.5: Factoring Polynomials

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9:57 AM

to "factor a polynomial" means to rewrite it as the product of polynomials

example: $2x + 6 = 2(x + 3)$

↑
not factored

factored

factoring at the greatest common factor (GCF):

$$3x^2y - 6xy^2 = 3xy(x - 2y)$$

$$60a^2b^5 + 140a^9b^2 - 4a^3b^6$$
$$= 4a^2b^2(15b^3 + 35a^7 - ab^4)$$

$$70x^2 - 84x + 42x^3 = 2x(35x - 42 + 21x^2)$$
$$= 14x(5x - 6 + 3x^2)$$
$$= 14x(3x^2 + 5x - 6)$$

a different way to find the GCF coefficient:

70

84

42

$7 \cdot 10$

$2 \cdot 42$

$2 \cdot 21$

$(7)(2)5$

$2 \cdot 2 \cdot 21$

$(2)(3)(7)$

$2 \cdot (2)(7)3$

factoring out a binomial:

$3(y-4) + b(y-4)$

$(y-4)(3+b)$

$\text{or } (3+b)(y-4)$

$3(y-4) + b(4-y)$

$3(y-4) - b(-4+y)$

$3(y-4) - b(y-4)$

$(3-b)(y-4)$

$\text{or } (b-3)(4-y)$

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

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

$$(x+y)^3$$

factoring by grouping: \Leftarrow for polynomials with four terms

$$2a + 2b + wa + wb$$

$$2(a+b) + w(a+b)$$

$$(2+w)(a+b)$$

$$pr + 2a - 2r - ap$$



$$pr - 2r + 2a - ap$$

$$r(p-2) + a(2-p)$$

$$r(p-2) - a(p-2)$$

$$(r-a)(p-2)$$

$$pr - ap + 2a - 2r$$

$$p(r-a) + 2(a-r)$$

$$p(r-a) - 2(r-a)$$

$$(p-2)(r-a)$$