

all done

INTERMEDIATE ALGEBRA

GPS # 19

5.3 FACTORING POLYNOMIALS

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Useful Guidelines:

Greatest Common Factor: The largest common term that can be factor out from the polynomial.

For example: $3xy^2 + 6x = 3x(y^2 + 2)$, where $3x$ is the Greatest Common Factor.

Factoring by grouping:

Step 1: Group the terms so that each group has a common factor.

For example: $6x - 6y + 2x - 2y = (6x - 6y) + (2x - 2y)$

Step 2: Factor out the common factor in each group.

For example: $(6x - 6y) + (2x - 2y) = 6(x - y) + 2(x - y)$

Step 3: Factor out the common factor from the groups, if possible. Otherwise, try a different grouping. For example: $6(x - y) + 2(x - y) = (x - y)(6 + 2) = 8(x - y)$

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1. Factor out the greatest common factor. Simplify the factors, if possible.

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

b) $6p^2q^3 - 12pq = 6pq(pq^2 - 2)$

a) $(p-2)(p+2) - (p+4)(p+2) = (p+2)[(p-2) - (p+4)]$
 $= (p+2)[p-2-p-4]$
 $= (p+2)[-6]$

b) $(x-3)(y+2) - (x+4)(y+2) = (y+2)[(x-3) - (x+4)]$
 $= (y+2)[x-3-x-4]$
 $= (y+2)[-7]$
 $= -7y - 14$

2. Factor by grouping and simplify the factors, if possible.

a) $3x + 3y + 7x + 7y = 3(x+y) + 7(x+y)$
 $= (x+y)(3+7)$

b) $15a + 3n + 5ab + nb = 3(5a+n) + b(5a+n)$
 $= (5a+n)(3+b)$

c) $30 + 5x + 18y + 3xy = 5(6+x) + 3y(6+x)$
 $= (6+x)(5+3y)$

d) $4m^3 + m^2 - 24m - 6 = m^2(4m+1) - 6(4m+1)$
 $= (4m+1)(m^2-6) = (4m+1)(m-\sqrt{6})(m+\sqrt{6})$

e) $2ab - 2b + 1 - a = 2b(a-1) - 1(a-1)$
 $= (a-1)(2b-1)$

3. Solve the equation.

a) $6y^2 + 3y = 0$ $3y(2y+1) = 0$
 $3y = 0$ or $2y+1 = 0$
 $y = 0$ or $y = -\frac{1}{2}$

Sol. set $\{y | 0, -\frac{1}{2}\}$
or $\{0, -\frac{1}{2}\}$

b) $8x^3 = 2x^2$ $8x^3 - 2x^2 = 0$
 $2x^2(4x-1) = 0$

R0907 a.s. $2x^2 = 0$ or $4x-1 = 0$
 $x = 0$ or $4x = 1$
 $x = \frac{1}{4}$

<http://faculty.valencia.cc.fl.us/ashaw>
Sol. set $\{x | 0, \frac{1}{4}\}$
or $\{0, \frac{1}{4}\}$