COLLEGE ALGEBRA

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GPS # 35 4.3 SOLUTION OF POLYNOMIAL EQUATIONS

Class Time: 11:30 Date: 3/27/08

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: $6(x - y) + 2(x - y) = (x - y)(6 + 2) = 8(x - y)$

Good w/ no help!

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

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

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

c) $(p-2)(p+2) - (p+4)(p+2) =$ $(p+2)[(p-2)-(p+4)] = -6(p+2) =$ $-6p-12$

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

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

a) $(3x+3y)+(7x+7y) =$ $3(x+y)+7(x+y) = 10(x+y) = 10x+10y$

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

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

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

3. Solve the polynomial equation by factoring and give the solution set.

a) $3x^3 - 12x = 0$

$3x(x^2-4) = 0$

$3x = 0$ or $x^2-4 = 0$

$x = 0$ $(x-2)(x+2) = 0$

$x = 2$ or $x = -2$

$x = \pm 2$

Sol set: $\{x \mid x = 0 \text{ or } x = \pm 2\}$

b) $(4m^3 + m^2) - (16m - 4) = 0$

$m^2(4m+1) - 4(4m+1) = 0$

$m^2 - 4 = 0$ or $4m + 1 = 0$

$m = \pm 2$ or $m = -\frac{1}{4}$

Sol set: $\{-2, 2, -\frac{1}{4}\}$