MATH 0270/1314 COLLEGE ALGEBRA Week 6 Wednesday 2/27/19

FACTORING

(1) common factor

(2) by grouping

(3) difference of two squares.

- multiplying conjugates results in two squares subtracted

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

  e.g. $(x+5)(x-5) = x^2 \cancel{-5x} \cancel{+5x} - 25 = x^2 - 25$

- factoring based on the difference of two squares is the reverse of multiplying conjugates.

  ① take the square root of each term, put them in each parenthesis

  ② put an opposite sign inside each parenthesis between the two terms.

e.g. (1) $m^2 - 4$

$= m^2 - 2^2$

$= (m+2)(m-2)$

(2) $16x^2 - 9$

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

$= (4x+3)(4x-3)$

(3). $4xy^2 - 4xz^2$

$= 4x(y^2 - z^2)$

$= 4x(y+z)(y-z)$

(4) $16x^2 - 25z^2$

$= (4x)^2 - (5z)^2$

$= (4x+5z)(4x-5z)$

(5) $x^4 - 49$

$= (x^2)^2 - 7^2$

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

(6) $a^6 - 25$

$= (a^3)^2 - (5)^2$

$= (a^3+5)(a^3-5)$

← 1^{st} property of exponent:

$x^b \cdot x^b = x^{2b}$

$(x^b)^2 = x^{2b}$

(7) $z^{10} - 36$

$= (z^5)^2 - 6^2$

$= (z^5+6)(z^5-6)$

☆ If you have an even exponent, then you can make it into a perfect square. $x^{2n} = (x^n)^2$

(8) $y^{24} z^{30} - 64$

$= (y^{12} z^{15})^2 - 8^2$

$= (y^{12} z^{15} + 8)(y^{12} z^{15} - 8)$

(9) $x^4 - 16$

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

$= (x^2+4)(x^2-4)$ ← FACTOR COMPLETELY.

$= \underbrace{(x^2+4)}(x+2)(x-2)$

→ cannot be factored any more.

sum of squares