MATH 0270/1314 COLLEGE ALGEBRA Week 6 Thursday 2/28/19

Quiz #6

(2) $2x(3x-5)+7(3-5)$

$=(2x+7)(3x-5)$

(3) $x^3+5x^2-5x-25$

$=x(x^2+5x)-(5x+25)$

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

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

(4) $5x^3-10x^2+3x-6$

$=(5x^3-10x^2)+(3x-6)$

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

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

← $5x^2$ is the common factor for the first two terms, notice that $x^{(2)}$ is the smallest exponent there.

WEBASSIGN PRACTICE.

(1) $\frac{9}{7}y(y+1)-3(y+1)$

$=(y+1)(\frac{9}{7}y-3)$

$=(y+1)(\frac{9y}{7}-\frac{3\cdot 7}{1\cdot 7})$

$=(y+1)(\frac{3}{7}\cdot(3y)+\frac{3}{7}(7))$

$=\boxed{(y+1)(3y+7)\cdot(\frac{3}{7})}$

← not finished because the coefficient is not an integer. to "get rid" of the fraction, multiply the other terms in the same parenthesis by the top/bottom denominator.

(2) $98-72z^2$

$=2(49-36z^2)$

$=2(7^2-(6z)^2)$

$=2(7-6z)(7+6z)$

(3) $(x-9)^2 - 64$

$= (x-9)^2 - 8^2$

$= (x-9+8)(x-9-8)$

$= (x-1)(x-17)$

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

$(a^2 + b^2)$ is a "prime" polynomial, meaning it cannot be further reduced (factored).

Sum and Difference of Cubes.

- factors into a (binomial)·(trinomial)
- both ~~$\$$~~ can be ~~factored~~.
- important question is to see what's the cube root~~s~~ of each term~~s~~.

$\sqrt[3]{1} = 1$	$1^3 = 1$
$\sqrt[3]{8} = 2$	$2^3 = 8$
$\sqrt[3]{27} = 3$	$3^3 = 27$
$\sqrt[3]{64} = 4$	$4^3 = 64$
$\sqrt[3]{125} = 5$	$5^3 = 125$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

e.g.(a) $x^3 + 8 = (x+2)(x^2 - 2x + 2^2) = (x+2)(x^2 - 2x + 4)$

$\sqrt[3]{x^3} = x$, $\sqrt[3]{8} = 2$

$x^3 - 8 = (x-2)(x^2 + 2x + 4)$.

e.g.(b). $(8x^3 - 125)$

$= (2x-5)((2x)^2 + (2x)\cdot 5 + 5^2)$

$= (2x-5)(4x^2 + 10x + 25)$

$\sqrt[3]{8x^3} = \sqrt[3]{(2x)^3} = 2x$

$\sqrt[3]{125} = 5$.

square

multiply

square

memory device for the signs

- Same
- Opposite
- Always
- Positive

WEBASSIGN PRACTICE.

(1). $x^5 + 2x^3 + x^2 + 2$.

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

$= x^3(x^2 + 2) + (x^2 + 2)$

$= (x^2 + 1)(x^3 + 1)$ ← sum of cubes.

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

$\sqrt[3]{x^3} = x$, $\sqrt[3]{1} = 1$.