3.2

Wednesday, November 20, 2019 8:27 AM

3.2 FACTORING POLYNOMIAL EXPRESSIONS Name: _____ Blk: ____

New Skill #1: Factoring trinomials with RATIONAL coefficients

- **Factor out** the decimal place or the denominator first
- You are not 'multiplying' the decimal/fraction away ... you are **factoring it out**

$4x^2 + 2x \rightarrow 2x(x+1)$

- Example: Factor $(0.3x^2 - 1.3x - 1)$

Factor out 0.1 or $\frac{1}{10}$

$0.1(3x^2 - 13x - 10)$ factor this!

$-15 \times -2 = -30$
$-15 + 2 = -13$

$0.1(3x^2 - 15x + 2x - 10)$

$0.1[3x(x-5) + 2(x-5)]$

$0.1(x-5)(3x+2)$

- Example: Factor $(x^2 - \frac{17}{3}x - 2)$ Factor out $\frac{1}{3}$

$\frac{1}{3}(3x^2 - 17x - 6)$

$-18 \times 1 = -18$
$-18 + 1 = -17$

$\frac{1}{3}(3x^2 - 18x + x - 6)$

$\frac{1}{3}(x-6)(3x+1)$

New Skill #2: Factoring trinomials with binomial terms

- Example:
  Factor: $3(2x+5)^2 + 10(2x+5) - 8$

binomial

↓ Sub $(2x+5) = y$

$3y^2 + 10y - 8$

$-x- = -24$
$-+- = 10$

↓ Factor

$(y+4)(3y-2)$

↓ Sub $y = (2x+5)$ and simplify

$(2x+5+4)(3(2x+5)-2)$

$(2x+9)(6x+15-2)$

$\boxed{(2x+9)(6x+13)}$

- Example:
  Factor: $6(3x-4)^2 - 21(3x-4) + 15$

↓ Sub $(3x-4) = y$

$6y^2 - 21y + 15 \rightsquigarrow 3(2y^2 - 7y + 5)$

↓ Factor

$3(2y-5)(y-1)$

↓ Sub $y = (3x-4)$ and simplify

$3[2(3x-4)-5][3x-4-1]$

$\boxed{3(6x-13)(3x-5)}$

Factoring Using Difference of Squares.
RECALL $a^2 - b^2 = (a+b)(a-b)$

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

- Example:
  Factor: $(3x+4)^2 - (2y-1)^2$

↓ Sub $(3x+4) = a$
$(2y-1) = b$

$a^2 - b^2$

↓ Factor

$(a+b)(a-b)$

↓ Sub $a = (3x+4)$
$b = (2y-1)$

$[(3x+4)+(2y-1)][(3x+4)-(2y-1)]$
$(3x+2y+3)(3x-2y+5)$

4+1

YOU TRY

- Example:
  Factor: $32(x+2)^2 - 18(2y-3)^2$

↓ Sub $(x+2) = a$
$(2y-3) = b$

$32a^2 - 18b^2 \rightarrow$ GCF $2(16a^2 - 9b^2)$

Now we have perfect squares!

factor your diff. of squares.

↓ Factor

$2(4a+3b)(4a-3b)$

↓ Sub $a = (x+2)$
$b = (2y-3)$

$2[4(x+2)+3(2y-3)][4(x+2)-3(2y-3)]$
$2(4x-6y+17)(4x+6y-1)$

p. 194 - #3-6, 9-13, 15, 16, 18 (every other letter)
19, 20

Assignment: