3.1 Notes Review

Friday, November 20, 2015 8:56 AM

Factoring Polynomial Expressions Name_____ Blk_____

Remember that time in Math 10?

- "Expand" $(x+4)(x-3)$

$x^2-3x+4x-12$

x^2+x-12

- "Expand" $(2x+1)(3x-5)$

- "Factor" $x^2-8x+15$

ax^2+bx+c $a=1$

$(x-5)(x-3)$

- "Factor" $2x^2-5x-12$ $a \neq 1$ ac method

$2x^2-8x+3x-12$

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

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

$ac = -24$

$-8, 3$ $(x-4)(2x+3)$

criss cross

$x \quad -4$

$2x \quad 3$

$3x-8x=-5x$

- "Perfect Square"

product of a rational number multiplied by itself. 9 $25x^2$ $64y^4$

- "Difference of Squares"

a^2-b^2

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

or

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

Factor the following polynomials:

a. $a^2+8a+15$

$(a+5)(a+3)$

b. $5b^2-20b+20$ "factor out a 5"

$5(b^2-4b+4)$

$5(b^2-4b+2^2)$

perfect squares.

$5(b-2)^2$

YOU TRY

c. $9c^2 + 42c + 49$

$3c^2 \quad 7^2$

$(3c+7)^2$

d. $4d^2 - 4d - 15 \qquad -60$

$(2d+3)(2d-5)$

e. $25e^2 - 64$

$5^2e^2 - 8^2$

$(5e-8)(5e+8)$

f. $5f^4 + 17f^2 - 12 \qquad 5 \times -12 = -60$

$5f^4 + 20f^2 - 3f^2 - 12$

$(f^2+4)(5f^2-3)$

New Skill #1: Determining whether a given binomial is a factor of a given trinomial using logic

- Guess the other factor using the first and last terms of the given trinomial and then expand

- Example: Is $(x + 3)$ a factor of $(2x^2 + x - 15)$?

$(x+3)(ax+b) = 2x^2 + x - 15$

$(x)(\underline{2x}) = 2x^2$

$(3)(\underline{-5}) = -15$

Expand: $(x+3)(2x-5)$

$2x^2 - 5x + 6x - 15$

$2x^2 + x - 15$ ✓

Therefore, $(x + 3)$ IS / IS NOT a factor of $(2x^2 + x - 15)$

- Example: Is $(d-4)$ a factor of $(3d^2+13d+4)$?

  $(d-4)(\_\_\_\_\_) = (3d^2+13d+4)$

  $(d)(3d) = 3d^2$

  $(-4)(-1) = 4$

  Expand: $(d-4)(3d-1)$

  $3d^2-d-12d+4$

  $3d^2-13d+4$

  Therefore, $(d-4)$ IS (IS NOT) a factor of $(3d^2+13d+4)$

Assignment for marks: Hand in for end of class!

1. Determine whether $x+5$ is a factor of: $2x^2-2x-40$

2. Is $3x+1$ a factor of the trinomial $15x^2+2x-1$

3. Factor the following trinomial $x^2+\frac{7}{3}x-2$

4. Factor this polynomial expression: $3(2x-3)^2-4(2x-3)-4$

5. Factor this polynomial expression $48(4x-1)^2-75(2y+3)^2$

Bonus:
Factor this polynomial expression $25x^2-10x+1-25y^2$

Why Are Small Balloons Cheaper Than Large Balloons?

Factor completely each polynomial below. Find your answer below the exercise and notice the letter next to it. Write this letter in each box containing the number of that exercise.

(1) $a^2 - 9ab + 20b^2$
(2) $3a^2 + 6ab - 24b^2$
(3) $7a^2 - 28b^2$
(4) $4a^2 + 14ab + 12b^2$
(5) $a^3 - 4a^2b - 21ab^2$
(6) $a^3b - ab^3$

Answers:

(E) $7(a + 4b)(a + b)$
(A) $a(a - 7b)(a + 3b)$
(O) $7(a + 2b)(a - 2b)$
(R) $(a - 4b)(a - 5b)$
(T) $a(a + 21)(a - 1)$
(H) $ab(a + b)(a - b)$
(M) $3(a - 8b)(a - b)$
(C) $2(2a - 6b)(a + b)$
(N) $3(a + 4b)(a - 2b)$
(V) $ab(a + 3b)(a - 2b)$
(S) $2(2a + 3b)(a + 2b)$

(7) $2x^3 - 12x^2y - 14xy^2$
(8) $9x^3 - 6x^2y + xy^2$
(9) $15x^2 + 35xy - 50y^2$
(10) $x^4 + 12x^3y + 35x^2y^2$
(11) $15x^4 - 27x^3y - 6x^2y^2$
(12) $8x^3y - 50xy^3$

Answers:

(F) $5(3x + 10y)(x - y)$
(K) $2x(x + 7y)(x + 2y)$
(L) $2xy(2x + 5y)(2x - 5y)$
(D) $5(3x - 2y)(x - 5y)$
(T) $x^2(x + 5y)(x + 7y)$
(B) $x(3x - y)^2$
(U) $3x^2(5x - 2y)(x - y)$
(I) $2x(x - 7y)(x + y)$
(P) $x^2(x + 5y)(x - 9y)$
(E) $3x^2(5x + y)(x - 2y)$
(W) $x(9x + y)(x - y)$

10	6	11	1	11	4	8	11	11	2	12	11	4	4	7	2	9	12	5	10	7	3	2

OBJECTIVE 3–u: To factor polynomials completely (polynomials with factors of the form $ax^2 + bxy + cy^2$).