3.1 v.final notes

Monday, November 23, 2015 9:33 AM

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

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

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

  $(-4)(\_\_\_\_\_) = 4$

  Expand: $(d-4)(\_\_\_\_\_)$

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

Assignment for marks:

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 $ax^2 + bxy + cy^2$).

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

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(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) $x(9x + y)(x - y)$

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Chapter 3.1 Factoring Polynomial Equations

Pre-Calculus 11 Name_____ _____

Notes

Example 4 Factor each polynomial expression using the Difference of Squares Pattern.

a. $a^2 - b^2$

b. $(3x + 4)^2 - (2y - 1)^2$

c. $27(2x - 3)^2 - 75(y - 4)^2$

3.1 Intro Notes

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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

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

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

-5, -3, $+8$

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

$6x^2-7x-5$

- "Factor" $2x^2-5x-12$

"ac" method

criss cross method.

$2(-12)=-24$

$-8, 3$

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

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

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

x -4

$2x$ 3

$3x-8x=-5x$

- "Perfect Square"

product of a rational number multiplied by itself $25, 64x^2$

- "Difference of Squares"

a^2-b^2

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

OR

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

Factor the following polynomials: practice.

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

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

b. $5b^2-20b+20$

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

b^2, 4 are perfect squares.

$5(b-2)^2$

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

$(3c+7)^2$

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

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

e. $25e^2 - 64$

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

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

f. $5f^4 + 17f^2 - 12$

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

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 $(2x^2 + x - 15)$?

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

$(x)(2x) = 2x^2$

$(3)(-5) = -15$

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 $(3d^2+13d+4)$?

$(d-4)(\quad ax+b \quad) = (3d^2+13d+4)$

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

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

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

$3d^2 - 13d + 4$

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

New Skill #2: 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**

- Example: Factor $(0.3x^2 - 1.3x - 1)$ factor out $\frac{1}{10}$ or 0.1

$0.1(3x^2 - 13x - 10)$

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

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

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

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

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

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

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

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

HW check next day

Assignment * p. 176 # 3-6bd, 7b, 8, 9, 10bd

optional puzzle on back of handout

Wednesday's lunch tutorial for month

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New Skill #3: Factoring trinomials with binomial terms

- Example:

Wednesday's lunch tutorial for month

New Skill #3: Factoring trinomials with binomial terms

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

  ↓ Sub $(2x+5) = y$

  _____

  ↓ Factor

  _____

  ↓ Sub $y = (2x+5)$ and simplify

  _____

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

  ↓ Sub $(3x-4) = y$

  _____

  ↓ Factor

  _____

  ↓ Sub $y = (3x-4)$ and simplify

  _____

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

  ↓ Sub $(3x+4)=a$
  $(2y-1)=b$

  _____

  ↓ Factor

  _____

  ↓ Sub $a=(3x+4)$
  $b=(2y-1)$

  _____

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

  ↓ Sub $(x+2)=a$
  $(2y-3)=b$

  _____

  ↓ Factor

  _____

  ↓ Sub $a=(x+2)$
  $b=(2y-3)$

  _____

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(I) $2x(x - 7y)(x + y)$

(P) $x^2(x + 5y)(x - 9y)$

(E) $3x^2(5x + y)(x - 2y)$

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