Math122 College Algebra

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P.7
Factoring

- The process of factoring is
$$x^2 - 9 = (x - 3)(x + 3)$$

- The process of expanding is
$$(x - 3)(x + 3) = x^2 - 9$$

- $(x - 3)$ and $(x + 3)$ are factors of $x^2 - 9$

Problem

- Factor each of the following by finding the greatest common factor

  1. $27x^3 + 9x$

  2. $8y^3z^2 + 6y^2z - 2y^4z^4$

Problem

- Factor and simplify

  1. $(y+2)^2 - 3(y+2)$

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

Factoring Trinomials

- Consider factoring the trinomial
$$x^2 + bx + c$$

- If the factors are $(x + r)(x + s)$ it must be the case that

  1. $(x + r)(x + s) =$
  2. $r + s =$
  3. $rs =$

- Factor $y^2 + 10y + 24$

Factoring Trinomials

- Consider factoring the trinomial
$$ax^2 + bx + c \; where \; a \neq 1$$

- If the factors are $(px + r)(qx + s)$ it must be the case that

1. $(px + r)(qx + s) =$
2. $pq =$
3. $rs =$
4. $ps + qr =$

- Factor $6y^2 + 7y - 5$

Problem

- Factor each of the following:

  1. $x^2 - 3x - 10$

  2. $6y^2 - 5y - 4$

Problem

- Factor each of the following:

    1. $2y^2 + 5y + 2$

    2. $3x^2 + 7x - 20$

Special Factoring Formulas

1. $A^2 - B^2 =$

2. $A^2 + 2AB + B^2 =$

3. $A^2 - 2AB + B^2 =$

4. $A^3 - B^3 =$

5. $A^3 + B^3 =$

Problem

- Factor each of the following:

    1. $9x^2 - 16$

    2. $27y^3 - 1$

    3. $y^6 + 8$

Perfect Squares

- Factor the following perfect squares:

  1. $y^2 + 8y + 16$

  2. $4y^2 - 4xy + x^2$ (error in notes)

Completely Factor

- Completely factor each of the following:

    1. $2x^4 - 8x^2$

    2. $x^5y^2 - xy^6$

Factor by Grouping Terms

- Completely factor each of the following:

  1. $2y^3 + 3y^2 - 8y - 12$

  2. $3a^3 - 2a^2 - 3a + 2$