MAT1275CO College Algebra and Trigonometry - Section D103
Exam 2 - Study Guide

The following topics from Chapters 1.2.5 - 1.3.2 will be covered on Friday's exam.

- Finding the GCF
- Factoring out the GCF
- Factoring by Grouping
- Factoring Binomials
  - Difference of Perfect Squares $a^2 - b^2 = (a - b)(a + b)$
- Factoring Trinomials
  - Trinomials with Leading Coefficient 1
    - $x^2 + bx + c$ - Factor into the product of two binomials $(x + m)(x + n)$
    - $x^2 + bxy + cy^2$ - Factor into the product of two binomials $(x + my)(x + ny)$
  - Trinomials with Leading Coefficient Not Equal to 1 - $ax^2 + bx + c$
    - Factor using "The 'ac' Method"
- Simplifying Rational Expressions
- Multiplying Rational Expressions
- Dividing Rational Expressions

Practice Problems

1. Find the GCF of the following terms. (This question will have two parts.)
   (a) $35x, 42, 56x^2$
   (b) $x^{15}y^{12}z^{10}, x^7y^9z^{12}$
   (c) $(x + 4), x^2(x + 4), 2(x + 4)^2$
   (d) $50a^5b^3, 125a^3b^4, 100ab^5$
2. Factor by grouping. (This question will have one part.)
   (a) $x^3 + 7x^2 + 2x + 14$
   (b) $4x^2 - 10x + 6x - 15$
   (c) $xy + 3y + 2x + 6$
   (d) $ab + 7b + 8a + 56$

3. Factor. If factoring is not possible, state that the polynomial is prime. (This question will have four parts.)

   (a) $x^2 + 10x + 24$

   (b) $a^2 - 14a + 24$

   (c) $x^2 - 8xy - 9y^2$

   (d) $p^2 + 15pq + 20q^2$

   (e) $121x^2 - 16y^2$

   (f) $4a^2 - 36$

   (g) $3y^2 + 22y + 7$

   (h) $6b^2 - 13b + 5$

   (i) $u^2 - 9u - 12$

   (j) $x^2 + 15xy + 20y^2$

4. Simplify the rational expression completely. (This question will have four parts.)

   (a) $\frac{(x+9)}{(x+9)(x+7)}$

   (b) $\frac{2x^2-2}{x^2+2x+1}$

   (c) $\frac{5x^3+15x^2-20x}{5x(x+4)}$

   (d) $\frac{24x^6y^6}{9x^2y^2}$

   (e) $\frac{4x^2-4x-15}{4x-10}$

   (f) $\frac{32a^2b-16ab^2}{-8ab}$

   (g) $\frac{x^2-x-2}{x^2-3x+2}$

5. Multiply or divide the rational expressions and simplify completely. (This question will have three parts.)

   (a) $\frac{x+4}{x+2} \div \frac{x}{3x+6}$

   (b) $\frac{x^4}{2y^3} \cdot \frac{4y^5}{x^8}$

   (c) $\frac{6x^2-7x+2}{4x-8} \div \frac{2x^2-7x+3}{x^2-5x+6}$

   (d) $\frac{4m+4}{3m-15} \cdot \frac{12m-36}{m+1}$

   (e) $\frac{3a^2-8a-3}{a^2-25} \div \frac{3a^2-14a-5}{a^2+10a+25}$