

## Agenda/Objectives/Notes PAPPC Appendix A4

### Starter Problem

For the function  $f(x) = 12x^3 - 4x^2 - 27x + p$

1. State the number of zeros
2. State the number of possible positive and the number of negative real zeros
3. State the possible rational zeros
4. Find all the real zeros

### Today's Agenda

1. Starter problem
2. Review assignment due
3. Today's objectives
4. Today's assignment: Appendix A4 A43/6, 8, 21, 26, 28, 32, 33, 39, 42, 47, 49, 52, 57, 58, 65, 66, 75, 76, 80, 85

Today's Objectives: You will be able to

1. Find domains of rational algebraic expressions.
2. Simplify rational expressions.
3. +, -, x, and / rational expressions.
4. Simplify complex fractions and rewrite difference quotients.

### Notes/Examples

**Restrictions on domains:** these occur in most cases when there is an even indexed radical or a rational expression that contains a variable in the denominator.

**Ex:** Determine the domain for each of the following

a.  $f(x) = \sqrt{3x - 5}$

b.  $g(t) = \frac{2t - 5}{t^2 - 8}$

**Simplifying rational expression:** factor and cancel

**Ex:** Write the rational expression  $\frac{12 + x - x^2}{2x^2 - 9x + 4}$  in simplest form.

**Operations with rational expressions:**

**1. Multiplying rational expressions:** factor, cancel, then multiply

**Ex:** Multiply  $\frac{2x^2 + x - 6}{x^2 + 4x - 5} \cdot \frac{x^3 - 3x^2 + 2x}{4x^2 - 6x}$

**2. Dividing rational expressions:** reciprocate the divisor, factor, cancel, multiply

**Ex:** Divide  $\frac{x^3 - 8}{x^2 - 4} \div \frac{x^2 + 2x + 4}{x^3 - 8}$

**3. Adding/subtracting rational expressions:** Factor, find the **LCD**, multiply all expressions by the LCD, combine the expressions.

**Ex:** Combine  $\frac{3}{x-1} - \frac{2}{x} + \frac{x+3}{x^2-1}$

**Complex fractions:** These are fractions that contain fractions within them. Combine any terms in the numerator that can be combined then combine any terms in the denominator that can be combined then multiply through by the LCD and reduce if necessary.

**Ex:** Simplify  $\frac{\left(\frac{3}{x} - 3\right)}{\left(1 - \frac{1}{x-1}\right)}$