Midterm Review
Oct. 20, 2010

Chapter 0

Solve the following equations:

$$2x - 4x = -5$$

$$\frac{5y}{7} - \frac{6}{7} = 2 - 4y$$

$$\frac{4p}{7 - p} = 1$$

$$\frac{2}{x - 1} = \frac{3}{x - 2}$$

$$x^2 + 3x - 10 = 0$$

$$x^2 - 4 = 0$$

$$2x^2 + 4x = 5$$

$$\frac{3x + 2}{x + 1} - \frac{2x + 1}{2x} = 1$$

Factor these expressions as completely as possible

$$6y^2 - 3y$$

$$10xy + 5x^2 - 15xyz$$

$$x^2 - x - 6$$

$$3x^2 - 3$$

$$4x^2 - x - 3$$

Simplify the fractions as much as possible

$$\frac{a^2 - 9}{a^2 + 3a}$$

$$\left(\frac{t^2 - 9}{t^2 + 3t}\right)\left(\frac{t^2}{t^2 - 6t + 9}\right)$$

$$\frac{2}{t} + \frac{1}{3t}$$

$$\frac{4}{2x - 1} + \frac{x}{x + 3}$$

$$\frac{4}{x - 1} - 3$$

Chapter 1

Solve the equations/inequalities

$$5x - 2 \leq 2(x - 7)$$

$$2x - (7 + x) \leq x$$

$$-(5x + 2) \leq -(2x + 4)$$

$$-2(x + 6) > x + 4$$

$$3p(1 - p) > 3(2 + p) - 3p^2$$

$$3\left(5 - \frac{7}{3}q\right) < 9$$

$$\frac{x + 5}{3} - \frac{1}{2} \leq 2$$

$$|3 - 2x| = 7$$

$$|3 - 2x| > 7$$

$$|3 - 2x| < 7$$

$$\left|\frac{5x - 6}{13}\right| = 0$$

$$|2x - 3| < 5$$

$$4 < \left|\frac{2}{3}x + 5\right|$$

Evaluate the following summations

$$\sum_{k=1}^{n} k^2 + k + 1$$

$$\sum_{i=1}^{6} 2i - 5$$

$$\sum_{j=4}^{1} 0j^1 - 4$$

Consider the following word problems:

The perimeter of a rectangle is 300m and the length of the rectangle is twice the width. Find the dimensions of the rectangle.

A bartender makes a white Russian using 2 parts vodka, 1 part Kahlua and 3 parts milk. If you received a 300 mL drink, how much Kahlua was used?

Suppose consumers will purchase q units of a product when the demand is $100 - 10q$. At what demand will revenue be 260?

Chapter 2

Give the domain of the functions

$$f(x) = \frac{x}{x^2 - 6x + 5}$$

$$g(x) = x^4 + 5|x - 1|$$

$$h(x) = \frac{\sqrt{x}}{x-1}$$

$$H(x) = \frac{\sqrt{x-5}}{4}$$

Evaluate the function at the given points

$$f(x) = 3x^2 - 4x + 7; \qquad f(0),\ f(-3),\ f(5),\ f(t)$$

$$F(x) = \frac{x-3}{x+4}; \qquad F(-1),\ F(0),\ F(5),\ F(x+3)$$

$$H(s) = \frac{(s-4)^2}{3}; \qquad H(-2),\ H(7),\ H(1/2),\ H(x^2)$$

$$f(x) = \begin{cases} -3, & \text{if } x < 1 \\ 4 + x^2, & \text{if } x > 1 \end{cases} ; \qquad f(4),\ f(-2),\ f(0),\ f(1)$$

For the following f and g pairs, determine $(f+g)(x)$, $(f-g)(x)$, $(fg)(x)$, $(f/g)(x)$, $f(g(x))$, $g(f(x))$, $f(f(x))$ and $g(g(x))$.

$$f(x) = 3x - 1 \qquad g(x) = 2x + 3$$

$$f(x) = -x^2 \qquad g(x) = 3x - 2$$

$$f(x) = \frac{1}{x^2} \qquad g(x) = x + 1$$

$$f(x) = \frac{x+1}{x-1} \qquad g(x) = \sqrt{x-1}$$

Graph these functions. Find any x or y intercepts. Determine the domain.

$$f(x) = \frac{1}{x}$$

$$f(x) = |x - 2| + 3$$

$$f(x) = -\sqrt{x+3} - 4$$

$$f(x) = -(x-1)^2$$