MAT 206.5

Study Guide Exam II

Part I

1. Find all zeroes of the given function and draw its graph:

$$h(x) = 2x^3 + 3x^2 - 11x - 6$$

2. Find all zeroes of the function:

$$f(x) = 3x^3 - 7x^2 - 10x + 4$$

3. Find all zeroes of the function:

$$h(x) = 6x^4 - x^3 - 6x^2 - 12x - 5$$

Part II

4. Find the maximum or minimum point (specify which) of the following functions. You may use an alternative method for extra credit.
   a. $f(x) = x^2 - 6x + 1$
   b. $g(x) = -4x^2 - 4x - 5$
5. A home business making hand-designed scarfs can sell 40 scarfs per day at $50 and 60 scarfs per day at $25. Find the price that maximizes revenue.
6. Subtract: a. $\frac{x}{(x^2+8x+15)} - \frac{15}{x^2+4x-5}$ b. $\frac{3x}{4x^2-16} - \frac{2x-1}{8x-16}$
7. Solve: a. $\frac{4}{x+1} - \frac{5}{x} = \frac{20}{x^2+x}$ b. $\frac{3}{x+1} - \frac{4}{2x-1} = \frac{5}{2x^2+x-1}$
8. Simplify the complex fraction: $\frac{\frac{1}{2x} - \frac{1}{x^2}}{\frac{1}{2x} + \frac{1}{x^2}}$

9. (10 points) Graph the given function and find all vertical and horizontal asymptotes
   a. $g(x) = \frac{2x-1}{x+2}$ $b.$ $f(x) = \frac{x^2}{x^2-4}$

Answers:

1. $\left\{-3, -\frac{1}{2}, 2\right\}$ (graph not shown)

2. $\left\{\frac{1}{3}, 1 \pm \sqrt{5}\right\}$

3. $\left\{-\frac{1}{2}, \frac{5}{3}, \frac{1 \pm \sqrt{3}i}{2}\right\}$

4. a. $(3, -8)$ minimum b. $(-\frac{1}{2}, -4)$ maximum

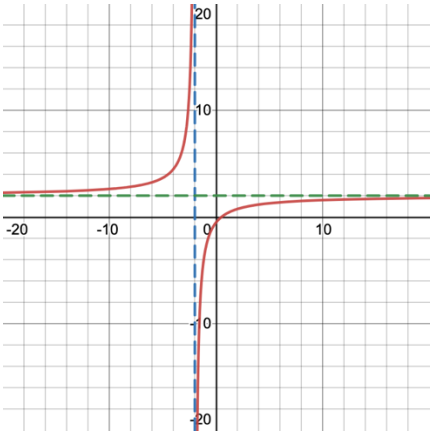
5. $50

6. a. $\frac{x^2-16x-45}{(x+3)(x+5)(x-1)}$ b. $-\frac{2x+1}{8(x+2)}$

7. a. $x = -25$ b. $x = 6$

8. $\frac{x-2}{x+2}$

9. Vertical Asymptote: $x = -2$
Horizontal Asymptote: $y = 2$



10. Vertical Asymptote: $x = \pm 2$
Horizontal Asymptote: $y = 1$