Practice Exam 2 :: Math 115

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1. **Common Evaluations**
   Assume $h \neq 0$ and $f(x) = 2x^2 - x$. Evaluate

$$\frac{f(a+h) - f(a)}{h}.$$

2. **Rate of Change**
   Compute the average rate of change of the function

$$f(x) = x^3 - \frac{1}{x}$$

   on the interval $[1, 5]$.

3. **The Domain of Functions**
   Find the domain of eac of the functions

$$\frac{\sqrt{(x+3)}}{2x^2+x-1}$$

$$\frac{1}{\sqrt{(x+3)}}$$

4. **Graphs of Functions**

Graph the each of the following polynomials, showing clearly all $x-$ and $y-$intercepts.

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

$$f(x) = -(x-2)^3 + 1$$

$$f(x) = (x-2)(x+1)(x+6)$$

5. Consider the following rational functions:

$$r(x) = \frac{2x-1}{x^2-x-2}, \quad s(x) = \frac{x^3+27}{x^2+4}, \quad f(x) = \frac{x^3-9x}{x+2}, \quad g(x) = \frac{x^2+x-6}{x^2-25}$$

(a) Which of these rational functions has a horizontal asymptote?

(b) Which of these rational functions has a slant asymptote?

(c) Which of these rational functions has no vertical asymptote?

(d) Graph $y = g(x)$ showing clearly any asymptotes.