Math 1050 - Quiz 3

1. Suppose $p(x) = 3x^2 + wx - 3$. Determine w so that $x+2$ is a factor of $p(x)$.

2. Consider the graph of the function $f(x) = \dfrac{2x^2 - 14x + 24}{x^2 - 9x + 20}$.

   a) Find all vertical asymptotes.

   b) Determine all x-intercepts.

   c) Find all the horizontal asymptotes.

3. Use the Online Grapher or a graphing calculator to sketch the graph of $y = f(x) = x^2 - 3x - 11$. Now trace along the graph to approximate the largest zero of f.

4. Sketch the graphs of the following functions:

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

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

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

How do they differ at the points $x = 2$, $x = 3$, *and* $x = -1$?

5. Solve the inequality $(x-8)(x-3)(x+5) > 0$

6. Use division to find the polynomial part $q(x)$ and remainder r when $p(x) = 3x^3 + 5x^2 - 3x + 1$ is divided by $x - 4$.

7. Suppose $p(x) = x^3 - 9x^2 + 26x - 24$. Given that $p(2) = 0$, find (exactly) the other two solutions to the equation $p(x) = x^3 - 9x^2 + 26x - 24 = 0$.