Math 121 – Exam 1A – Fall 2013

Show your work. No work will result in no points.
No calculutors or cell phones.

1) Let $f(x) = \frac{x^2-3x-10}{2x^2-8x-10}$. Find the following: (20 pts.)
   a) the x-intercept(s)
   b) the y-intercept
   c) all the values of x for which f(x) is undefined and specify whether each undefined point corresponds to a vertical asymptote or a hole
   d) the horizontal asymptote

2) Let $f(x) = x^3 + x^2 - 5x - 5$ (20 pts.)
   a) list all the potential rational roots of $f(x)$
   b) find the roots of $f(x)$

3) Solve the inequality $x^2 \geq -x + 42$ (15 pts.)

4) Let $f(x) = \frac{3}{x-3}$ and $g(x) = \frac{4}{x+2}$. FInd the following: (15 pts.)
   a) f(g(5))
   b) the domain of f(g(x))

5) Let $f(x) = 2x^2 + 3x$. Find the following: (15 pts.)
   a) g(x) which is f(x) shifted up 10 units
   b) h(x) which is g(x) reflected across the x-axis
   c) j(x) which is h(x) shifted to the right 1 unit

6) $3i$ is a root of $f(x) = x^4 + 10x^2 + 9$. Find the remaining roots. (15 pts.)