MATH 121 – Precalculus
Fall 2014

Exam 1
September, 29

Name: _____

UIN: _____

T/TH class time: _____

- You are expected to abide by the University's rules concerning Academic Honesty.
- You may *not* use your books, notes, or any electronic device including calculators and cell phones.
- Show ALL your work. Unsupported answers will not receive credit.
- Always state a complete answer to the problem.

(20 pts) **1.** Consider the quadratic function $p(x) = x^2 + 6x - 7$.

a) Determine the $x-$intercepts of the graph $y = p(x)$.

b) Determine the absolute maximum and minimum of $p(x)$ and list the points where the absolute minimum and/or maximum is achieved.

c) Determine the intervals where $p(x)$ is increasing.

(15 pts) **2.** Consider $q(t) = 2t^3 - 2t^2 + 47t + 51$.

a) List the potential rational zeros of $q(t)$.

b) Factor $q(t)$ into a product of linear terms.

(15 pts) **3.** Find the oblique asymptote for $h(t) = \dfrac{t^3 - 3t^2 + 2t + 1}{t^2 + 7t + 5}$.

(30 pts) **4.** Follow the steps to sketch the graph of $R(x) = \dfrac{(2x+7)(x-3)^2}{(x+2)^3}$.

a) Determine the $x-$intercepts and $y-$intercept of the graph.

b) Determine the vertical asymptotes of the graph.

c) Determine the horizontal/oblique asymptotes of the graph.

d) Sketch the graph and mark all the information from parts a), b) and c) on the graph.

(20 pts) **5.** Let $f(x) = \sqrt{x}$ and $g(x) = \dfrac{x+7}{x-11}$.

a) Evaluate $(g \circ f)(9)$.

b) Find $f \circ g$.

c) Determine the domain of $f \circ g$.