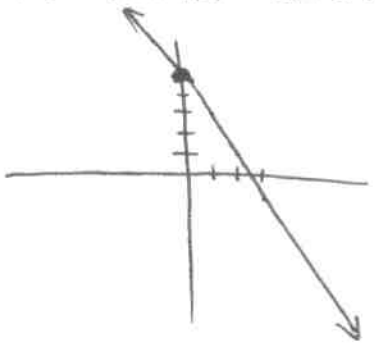
MTH 207 – Calculus I
Quiz 1
September 5, 2008

Name: _____

Answer each question to the best of your abilities. Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Good luck!

1. (*5 points*) Let $f(x) = -2x + 5$. Sketch the graph of f and find its domain and range.



Domain: $\mathbb{R}$
Range: $\mathbb{R}$

2. (*5 points*) Let $f(x) = 2 + 3x + x^2$. Evaluate and simplify the difference quotient

$$\frac{f(3+h) - f(3)}{h}.$$

$$\frac{f(3+h)-f(3)}{h} = \frac{(2+3(3+h)+(3+h)^2)-(2+9+9)}{h}$$

$$= \frac{(2+9+3h+9+6h+h^2)-20}{h}$$

$$= \frac{9h+h^2}{h} = 9+h$$

3. (*5 points*) A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 12 in. by 20 in. by cutting out equal squares of side x at each corner and then folding up the sides. Express the volume V of the box as a function of x.

$V(x) = (12-2x)(20-2x)x$