Math 120 A - Spring 2007
Mid-Term Exam Number One Answers
April 19, 2007

Version A: In problem 1, Rose will sell 150 tickets if she sets the price at \$20.

1. Rose should charge \$18.75 to make the most money.

2. (a) Area is 0.2 square feet.
   (b) Area is 1.61538 square feet.
   (c)
$$A(m) = \begin{cases} 2m & \text{if } 0 \leq m \leq \frac{1}{2} \\ 2 - \frac{1}{2m} & \text{if } m > \frac{1}{2} \end{cases}$$

3. She will be 16.4915 km south of the center when she is due south of it.

4. (a) The multipart rule if
$$g(f(x)) = \begin{cases} 2x + 3 & \text{if } x \geq -\frac{3}{2} \\ -2x - 3 & \text{if } x < -\frac{3}{2} \end{cases}$$
   (b) $x = \frac{6}{5}$ is the only solution to the equation $g(f(x)) = -3x + 9$.

Version B: In problem 1, Rose will sell 174 tickets if she charges \$22.

1. Rose should charge \$26.77 per ticket to make the most money.

2. (a) Area is 0.6 square feet.
   (b) Area is 1.6875 square feet.
   (c)
$$A(m) = \begin{cases} 2m & \text{if } 0 \leq m \leq \frac{1}{2} \\ 2 - \frac{1}{2m} & \text{if } m > \frac{1}{2} \end{cases}$$

3. She will be 14.4136 km south of the center when she is due south of it.

4. (a)
$$g(f(x)) = \begin{cases} 4x + 1 & \text{if } x \geq -\frac{1}{4} \\ -4x - 1 & \text{if } x < -\frac{1}{4} \end{cases}$$
   (b) The solutions are $x = -3$ and $x = \frac{2}{3}$.