**V1**

| 1 | 2 | 3 | 4 | 5 | 6 |
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Last Name:________________

First Name:________________

ID:________________ Section:____

Math 1051 Midterm #2. March 15, 2002

**Attention!** Please, note that this is the closed book test. You are not allowed to use graphing calculator. Simple calculators are allowed. Please, show all important steps in you solution but do not make your solution excessively long.

1. A circle has its center at the midpoint of the segment $P_1P_2$ and contains the origin. Find equation of the circle if

$$P_1 = (9, 6), \qquad P_2 = (-3, 2).$$

2. Find the function which is finally graphed after the following transformations are applied to the graph of $f(x) = \sqrt{x^3 + x}$. Write the intermediate result on each step.

a) Shift up 3 units;

b) reflect about $X$-axis;

c) reflect about $Y$-axis;

d) shift right 2 units.

3. Graph the function using the techniques of shifting, stretching, compressing, or reflecting.

$$f(x) = x^2 - 6x - 3.$$

4. Find the composite function $f \circ g$; specify it's domain; find average rate of change from $x = -1$ to $x = 2$:

$$f(x) = \frac{1}{3-x}, \qquad g(x) = \sqrt{3-x}.$$

5. Give equation of the line perpendicular to the line

$$y = -3x + 1$$

containing point (6,1)

6. Graph piecewise function

$$f(x) = \begin{cases} x, & x < 1 \\ 2, & 1 \le x \le 2 \\ -(x-2)^2 + 3, & x > 2. \end{cases}$$