MATH 107 6383, Fall, 2014
UMUC
Midterm Exam

Show your work on all the problems. Submit your completed exam in the assignment folder.

Total Points: 100
Due: September 21

1. a. Find the midpoint of the segment with endpoints (5, –2) and (7, 4).

   b. The point (4, –1) is on a circle with center (7, 3). Find the length of radius of the circle.

2. Simplify: $\frac{-32\,x^{-4}y^{3}}{4x^{-5}\,y^{8}}$

3. a. Find the slope-intercept equation for a line with slope 5 and which passes through the point (1, –2).

   b. Find the slope of the line through the points (8, 1) and (7, 3).

4. a. Solve: $\sqrt{2-7x} = 2$

   b. Solve $\sqrt{\sqrt{\sqrt{x}}} = 2$

5. Find the domain of the functions:

a. $f(x) = \frac{3}{x} + 2$

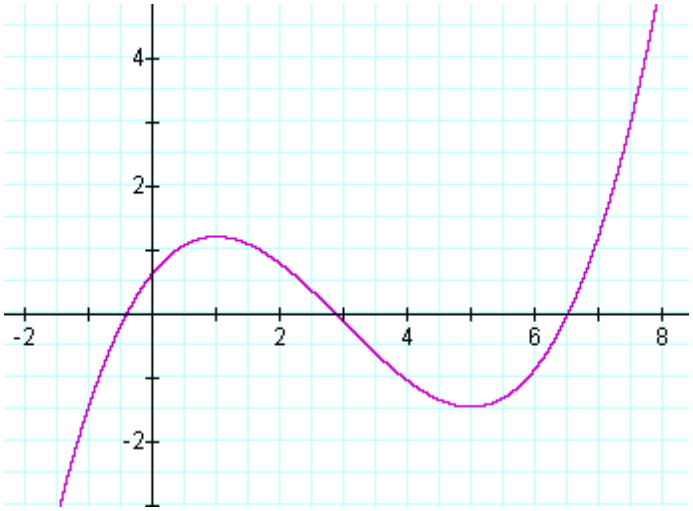
b. $f(x) = \frac{1}{x^2 - 6x + 5}$

6. a. For the graph of the function $f(x) = x^2 - 5x + 6$, find the vertex and the axis of symmetry.

b. One number is 2 more than another. The product of the numbers is 35. Find the numbers.

7. A salesperson earns a base salary of $2,000 per month and a commission of 5% on the amount of sales made. If the salesperson has a paycheck of $3,006 for one month, what was the amount of sales for the month?

8. a. For x values in what interval (s) is the function increasing?



b. Determine whether the graph of $y = 3 + x^2$ is symmetric with respect to x-axis, y-axis, or the origin.

9. a. Given $f(x) = 4/x^2$ and $g(x) = 3 - 2x$, find the composite function $(f \circ g)(x)$ and simplify.

b. Write the equation for a function that has a graph with the given properties.

The shape of $y = |x|$ but stretched vertically by a factor of 2 and shifted right 3 units.

10. a. Solve for n: $2(n - 1) = 3(n + 5)$

b. Find the zero of the function $f(x) = 8 - 2x$