Math 1051, sec 10, Fall 2010, Robertson, Exam 2 on Chapters 1 and 2

Friday, 22 October in 230 STSS

• Exam has 10 pages and 11 problems. Be sure you have them all.

• Exam is closed book and notes. You may use a scientific calculator but not a graphing calculator or a cell phone calculator.

• You have 50 minutes to do the exam. When the proctor calls time you must stop writing and hand in your papers or you may be given a score of 0%.

• Do all your work in the spaces provided on these sheets. If you need additional space ask the proctor for more paper.

• For problems that have more than one part, numbers in brackets [   ] indicate the point value for that part.

• Write your answer in the space provided for each problem. Answers must be in simplest form.

• Your solutions are graded primarily for procedure and partial credit is possible. To receive any points you must show the detailed mathematical steps needed to arrive at your answers.

You may NOT use a graphing calculator on this test. Doing so will result in a score of 0.

1. You earned ____ points out of 10.  
   Ans: __________________________
Find all points having a y-coordinate of 5 whose distance from the point (3, -2) is 8.  
**Round your answer to the nearest tenth.**

2. You earned ____ points out of 22.

Given this equation of a circle \(2x^2 + 8x + 2y^2 - 12 = 0\)

   **Ans:** __________________________

   **Ans:** __________________________
c. [2] Find the coordinates of the center. \textbf{Ans:} ________________________

d. [4] Find the x-intercept(s), if any. \textbf{Ans:} ________________________

e. [4] Find the y-intercept(s), if any. \textbf{Ans:} ________________________
3. You earned ____ points out of 10.

Given this function: \( f(x) = \frac{4x^4 - 3x^2}{5x^3} \)

a. [8] Is this function even, odd, or neither? **Ans:** ____________________________
   
   *You must show the algebra to justify your answer.*

b. [2] Is this function symmetric about the x-axis, y-axis, origin, or none of these? **Ans:** ____________________________

4. You earned ____ points out of 10. **Ans:** ____________________________

Find the equation of the line that is perpendicular to \( 3x - 4y = 5 \) and which passes through the point \((-3, 1)\). **Write your answer in slope-intercept form.**
5. You earned ____ points out of 10. \hspace{1cm} \textbf{Ans:} f(2x - 1) = \underline{\hspace{2cm}}

Given the function \( f(x) = 2x^2 - x + 5 \), find \( f(2x - 1) \). \textit{Write your answer in simplified form.}

6. You earned ____ points out of 10. \hspace{1cm} \textbf{Ans:} \text{Domain: } \underline{\hspace{2cm}}

Find the domain of \( f(x) = \frac{1}{\sqrt{2x - 1}} + \frac{1}{|2x - 1| - 2} \).
7. You earned ____ points out of 10.  
\textbf{Ans:} \( f(x) = \) ________________  
Given \( g(x) = 2x \) and \( \left( \frac{f}{g} \right)(x) = \frac{3x - 1}{x} \), find \( f(x) \). 

8. You earned ____ points out of 14.  
Given this graph:  
\begin{itemize}  
  \item[a.] [2] On what interval(s) is the function increasing?  
    \textbf{Ans:}  
  \item[b.] [2] On what interval(s) is the function decreasing?  
    \textbf{Ans:}  
  \item[c.] [2] On what interval(s) is the function constant?  
    \textbf{Ans:}  
  \item[d.] Skip  
  \item[e.] Skip  
  \item[f.] [2] What is the domain of the function?  
    \textbf{Ans:} ________________  
  \item[g.] [2] What is the range of the function?  
    \textbf{Ans:} ________________  
\end{itemize}
9. You earned ____ points out of 16.

Given the function \( f(x) = 3x^2 - x \)

a. [8] Find the Average Rate of Change of \( f(x) \) from 1 to 2. **Ans:** \( \text{ARC} = \) ________________

b. [8] Find the equation of the secant line for \( f(x) = 3x^2 - x \) that passes through \((1, f(1))\) and \((2, f(2))\). **Write the equation in slope-intercept form.**
10. You earned ____ points out of 14.

a. [10] Sketch the graph of

\[ f(x) = \begin{cases} 
  x^2 - 4 & \text{if } x < -1 \\
  3 & \text{if } 0 \leq x \leq 3 \\
  |x - 2| & \text{if } x > 4 
\end{cases} \]

b. [2] What is the domain of the function? Ans: ____________________________

c. [2] What is the range of the function? Ans: ____________________________
11. You earned ____ points out of 10.

Use transformations to graph \( f(x) = -\sqrt{4 - x} - 3 \). Show each step in the transformation starting with the graph of \( f(x) = \sqrt{x} \). You may not need all 6 x-y grids to accomplish the transformation.

**Step 1:** \( f(x) = \sqrt{x} \)

**Step 2:**

**Step 3:**

**Step 4:**
Sign here to certify that you did this exam by yourself and that you did not use a graphing calculator:

Signature: _______________________________    HWID:  _____________

On this exam you earned _____ points out of a total possible of 136.