EXAM 1 - MATH 111 Friday, February 11

YOUR NAME:_____ George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Consider the function $f(x) = \sqrt{5x + 11}$.

   (a) Find the domain $\text{Dom}(f)$. Write your answer in interval notation.

   (b) Find the average rate of change of f on the interval $[1, 5]$. Show all steps.

2. Sketch the graph of the piece-wise defined function $f(x) = \begin{cases} x + 3, & \text{if } x < -1 \\ x^2 - 2, & \text{if } x \geq -1 \end{cases}$ Please, be neat and label all important points.

3. Consider the functions $f(x) = \dfrac{2}{x-1}$ and $g(x) = \dfrac{1}{7-x}$.

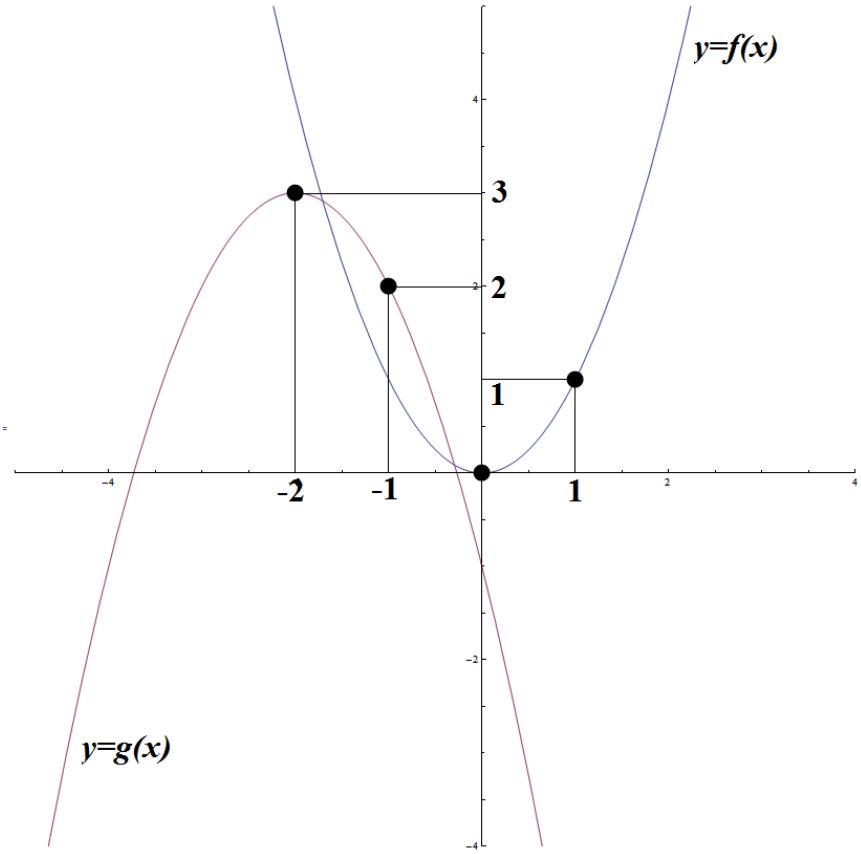
(a) Compute a formula for $(f \circ g)(x)$ and simplify.

(b) Find the value of $(g \circ f)(2)$.

(c) Find the domains $\mathrm{Dom}(f)$ and $\mathrm{Dom}(g)$.

(d) Find the domain of $f \circ g$. Please show all steps carefully.

4. The following figure shows the graphs of $f(x) = x^2$ and of $y = g(x)$.



Fill-in the following with the appropriate descriptions of the transformations needed to obtain the graph of $y = g(x)$ starting from the graph of $y = f(x)$.

Formula		Explanation of the Transformation
$y = x^2$	$\longrightarrow$	( )
	$\longrightarrow$	( )
	$\longrightarrow$	( )

5. Let $f(x) = |3x - 5| + 13$. Find the input values x for which $f(x) = 20$.