

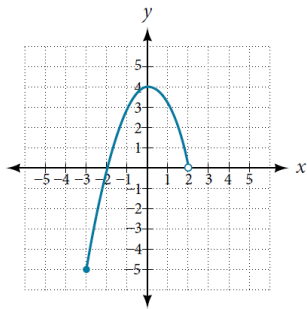
YOUR NAME: _____

George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. **GOOD LUCK!!**

1. [2 points] Find the domain of the function $f(x) = \frac{x - 3}{x^2 - 2x - 15}$.

2. [2 points] Find the domain and range of the function shown below:



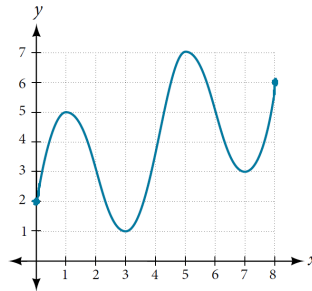
Dom(f) =

Ran(f) =

3. [3 points] Sketch the graph of the piecewise defined function $f(x) = \begin{cases} x^2, & \text{if } x < 1 \\ x - 1, & \text{if } x \geq 1 \end{cases}$.
Please make sure to label and show clearly all important points.

4. [3 points] Find the average rate of change of $g(x) = 3x^2 - 2$ on the interval $[2, 2 + h]$ and simplify.

5. [4 points] Consider the following graph of $y = f(x)$. Answer the following questions.



- (a) Over which intervals is f increasing?
- (b) What are the local maxima?
- (c) What are the local minima?
- (d) What is the absolute maximum and what is the absolute minimum (if any)?