

YOUR NAME: \_\_\_\_\_

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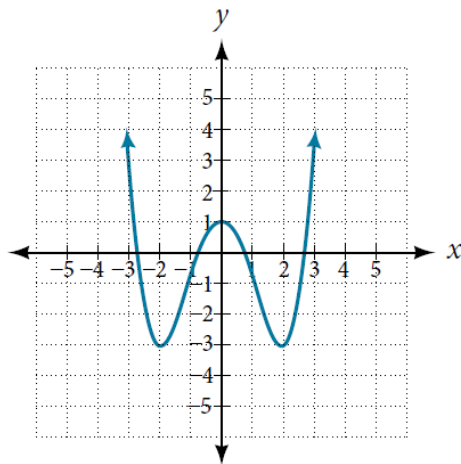
Read each problem **very carefully** before starting to solve it. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

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

2. [4 points] Sketch the graph of the piece-wise defined function  $f(x) = \begin{cases} x+5, & \text{if } x < -1 \\ -2x+3, & \text{if } x \geq -1 \end{cases}$   
Your graph should be neat and all important points must be labeled!

3. [4 points] Calculate the average rate of change of the function  $f(x) = 3x^2 - 7$  on the interval  $[1, a]$  and simplify.

4. [3 points] For the function  $y = f(x)$  whose graph is shown below find:



(a) All intervals over which  $f$  is increasing.

(b) All local max and local min points.