

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

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

1. Follow instructions very closely: Consider the quadratic function  $f(x) = -x^2 + x + 6$ .

(a) Find the vertex of the parabola  $y = f(x)$ .

(b) State the opening direction and justify.

(c) Find the  $x$ - and  $y$ -intercepts of  $y = f(x)$ .

(d) Roughly sketch the graph of  $y = f(x)$  indicating clearly all important points.

2. Consider the following piece-wise defined function:

$$g(x) = \begin{cases} x + 2, & \text{if } x < -1 \\ -x + 1, & \text{if } x \geq -1 \end{cases}$$

(a) Sketch the graph of  $y = f(x)$ .

(b) Find the following:

$$\lim_{x \rightarrow -1^-} f(x) =$$

$$\lim_{x \rightarrow -1^+} f(x) =$$

$$f(-1) =$$

$$\lim_{x \rightarrow -1} f(x) =$$