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. Sketch the graph of the following piece-wise defined function. Make sure to label all points of interest.

$$f(x) = \begin{cases} x^2 + 3x, & \text{if } x < 1 \\ -2x + 4, & \text{if } x \geq 1 \end{cases}$$

2. Compute the difference quotient of $f(x) = \dfrac{3}{2 - x}$ at $x = -4$ and simplify.