

Math 121 – Quiz 2 Solution

1. Find the vertex and axis of symmetry for the function:

$$f(x) = x^2 - 8x - 1$$

2. Solve the inequality:

$$-6 + 5x - x^2 < 0$$

Solution:

1. Complete the square:

$$\begin{aligned} f(x) &= x^2 - 8x - 1 \\ &= (x^2 - 8x + 16) - 1 - 16 \\ &= (x - 4)^2 - 17 \end{aligned}$$

The vertex is $\boxed{(4, -17)}$ and the axis of symmetry is $\boxed{x = 4}$.

2. Solving, we have:

$$\begin{aligned} -6 + 5x - x^2 &< 0 \\ f(x) &= (-3 + x)(2 - x) < 0 \end{aligned}$$

The graph of $y = f(x)$ opens down and has x -intercepts at $x = 3$ and $x = 2$. Since $f(x) < 0$, the solution is $\boxed{x < 2 \text{ or } x > 3}$.