

6.

Solution

Quadratic function: is a function that can be written in the form:

$$h(v) = av^2 + bv + c \quad \text{where } a, b, \text{ and } c \text{ are real numbers and } a \neq 0$$

we have $h(v) = -3v^2 + 4v + 21$, note: $-3v^2 + 4v + 21$ is in vh -plane

Here, we know that $a = -3$, $b = 4$, $c = 21$

Since $a < 0$, we know that the h -coordinate of the vertex is a maximum. However, to find the h -coordinate of our vertex we first need to find the v -coordinate of the vertex by using $v = -\frac{b}{2a} = -\frac{4}{-6} = \frac{2}{3}$. Now that we have the v -coordinate, we can find the h -coordinate

of the vertex by finding $h\left(\frac{2}{3}\right) = -3\left(\frac{2}{3}\right)^2 + 4\left(\frac{2}{3}\right) + 21 = -\frac{4}{3} + \frac{8}{3} + 21 = \frac{67}{3}$. Maximum = $\frac{67}{3}$