

6.

Solution

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

$$n(w) = aw^2 + bw + c \quad \text{where } a, b, \text{ and } c \text{ are real numbers and } a \neq 0$$

we have $n(w) = -3w^2 - 5w + 10$, note: $-3w^2 - 5w + 10$ is in wn -plane

Here, we know that $a = -3$, $b = -5$, $c = 10$

Since $a < 0$, we know that the n -coordinate of the vertex is a maximum. However, to find the n -coordinate of our vertex we first need to find the w -coordinate of the vertex by using $w = -\frac{b}{2a} = -\frac{-5}{-6} = -\frac{5}{6}$. Now that we have the w -coordinate, we can find the n -coordinate

of the vertex by finding $n(-\frac{5}{6}) = -3(-\frac{5}{6})^2 - 5(-\frac{5}{6}) + 10 = -\frac{25}{12} + \frac{25}{6} + 10 = \frac{145}{12}$. Maximum = $\frac{145}{12}$