

4.

Solution

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

$j(y) = ay^2 + by + c$ where a , b , and c are real numbers and $a \neq 0$

we have $j(y) = -3y^2 - 13y - 4$, note: $-3y^2 - 13y - 4$ is in yj -plane

Here, we know that $a = -3$, $b = -13$, $c = -4$

Since $a < 0$, we know that the j -coordinate of the vertex is a maximum. However, to find the j -coordinate of our vertex we first need to find the y -coordinate of the vertex by using $y = -\frac{b}{2a} = -\frac{-13}{-6} = -\frac{13}{6}$. Now that we have the y -coordinate, we can find the j -coordinate

of the vertex by finding $j\left(-\frac{13}{6}\right) = -3\left(-\frac{13}{6}\right)^2 - 13\left(-\frac{13}{6}\right) - 4 = -\frac{169}{12} + \frac{169}{6} - 4 = \frac{121}{12}$. Maximum = $\frac{121}{12}$