

6.

Solution

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

$d(t) = at^2 + bt + c$ where a , b , and c are real numbers and $a \neq 0$

we have $d(t) = 3t^2 - 11t + 7$, note: $3t^2 - 11t + 7$ is in td -plane

Here, we know that $a=3$, $b=-11$, $c=7$

Since $a>0$, we know that the d -coordinate of the vertex is a minimum. However, to find the d -coordinate of our vertex we first need to find the t -coordinate of the vertex by using $t = -\frac{b}{2a} = -\frac{-11}{2 \cdot 3} = \frac{11}{6}$ Now that we have the t -coordinate, we can find the d -coordinate

of the vertex by finding $d\left(\frac{11}{6}\right) = 3\left(\frac{11}{6}\right)^2 - 11\left(\frac{11}{6}\right) + 7 = \frac{121}{12} - \frac{121}{6} + 7 = -\frac{37}{12}$ Minimum $= -\frac{37}{12}$