5.

Solution

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

$t(k) = ak^2 + bk + c$ where a, b, and c are real numbers and $a \neq 0$

we have $t(k) = 2k^2 + 6k - 11$, note: $2k^2 + 6k - 11$ is in kt-plane

Here, we know that $a=2$, $b=6$, $c=-11$

Since $a>0$,we know that the t-coordinate of the vertex is a minimum. However,to find the t-coordinate of our vertex we first need to find the k-coordinate of the vertex by using $k = -\frac{b}{2a} = -\frac{6}{4} = -\frac{3}{2}$ Now that we have the k-coordinate, we can find the t-coordinate of the vertex by finding $t\left(-\frac{3}{2}\right) = 2\left(-\frac{3}{2}\right)^2 + 6\left(-\frac{3}{2}\right) - 11 = \frac{9}{2} - 9 - 11 = -\frac{31}{2}$ Minimum $= -\frac{31}{2}$