6.

Solution

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

$t(s)=as^2+bs+c$ where a, b, and c are real numbers and $a\neq 0$

we have $t(s)=3s^2-4s-4$, note: $3s^2-4s-4$ is in st-plane

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

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 s-coordinate of the vertex by using $s=-\frac{b}{2a}=-\frac{-4}{6}=\frac{2}{3}$ Now that we have the s-coordinate, we can find the t-coordinate of the vertex by finding $t\left(\frac{2}{3}\right)=3\left(\frac{2}{3}\right)^2-4\left(\frac{2}{3}\right)-4=\frac{4}{3}-\frac{8}{3}-4=-\frac{16}{3}$ Minimum$=-\frac{16}{3}$