

3.

Solution

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

$x(h) = ah^2 + bh + c$ where a , b , and c are real numbers and $a \neq 0$

we have $x(h) = 3h^2 - 3h - 4$, note: $3h^2 - 3h - 4$ is in hx -plane

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

Since $a > 0$, we know that the x -coordinate of the vertex is a minimum. However, to find the x -coordinate of our vertex we first need to find the h -coordinate of the vertex by using $h = -\frac{b}{2a} = -\frac{-3}{6} = \frac{1}{2}$ Now that we have the h -coordinate, we can find the x -coordinate

of the vertex by finding $x\left(\frac{1}{2}\right) = 3\left(\frac{1}{2}\right)^2 - 3\left(\frac{1}{2}\right) - 4 = \frac{3}{4} - \frac{3}{2} - 4 = -\frac{19}{4}$ Minimum $= -\frac{19}{4}$