1.

Solution

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

$x(z) = az^2 + bz + c$ where a, b, and c are real numbers and $a \neq 0$

we have $x(z) = 2 z^2 - 14 z + 11$,   note: $2 z^2 - 14 z + 11$ is in zx-plane

Here, we know that $a=2$, $b=-14$, $c=11$

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 z-coordinate of the vertex by using $z = -\frac{b}{2a} = -\frac{-14}{4} = \frac{7}{2}$ Now that we have the z-coordinate, we can find the x-coordinate of the vertex by finding $x(\frac{7}{2}) = 2(\frac{7}{2})^2 - 14(\frac{7}{2}) + 11 = \frac{49}{2} - 49 - 11 = -\frac{27}{2}$ Minimum $= -\frac{27}{2}$