6.

Solution

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

$s(y) = ay^2 + by + c$ where a, b, and c are real numbers and $a \neq 0$

we have $s(y) = 3y^2 + 15y + 11$, note: $3y^2 + 15y + 11$ is in ys-plane

Here, we know that $a = 3$, $b = 15$, $c = 11$

Since $a > 0$,we know that the s-coordinate of the vertex is a minimum. However,to find the s-coordinate of our vertex we first need to find the y-coordinate of the vertex by using $y = -\frac{b}{2a} = -\frac{15}{6} = -\frac{5}{2}$ Now that we have the y-coordinate, we can find the s-coordinate of the vertex by finding $s(-\frac{5}{2}) = 3(-\frac{5}{2})^2 + 15(-\frac{5}{2}) + 11 = \frac{75}{6} - \frac{75}{2} + 11 = -\frac{31}{4}$ Minimum $= -\frac{31}{4}$