6.

Solution

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

$s(q) = aq^2 + bq + c$ where a, b, and c are real numbers and $a \neq 0$

we have $s(q) = -2q^2 - 9q + 7$, note: $-2q^2 - 9q + 7$ is in qs-plane

Here, we know that $a = -2$, $b = -9$, $c = 7$

Since $a < 0$,we know that the s-coordinate of the vertex is a maximum.However,to find the s-coordinate of our vertex we first need to find the q-coordinate of the vertex by using $q = -\frac{b}{2a} = -\frac{-9}{-4} = -\frac{9}{4}$ Now that we have the q-coordinate, we can find the s-coordinate of the vertex by finding $s\left(-\frac{9}{4}\right) = -2\left(-\frac{9}{4}\right)^2 - 9\left(-\frac{9}{4}\right) + 7 = -\frac{81}{8} + \frac{81}{4} + 7 = \frac{137}{8}$ Maximum $= \frac{137}{8}$