

6.

Solution

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

$k(d) = ad^2 + bd + c$ where a , b , and c are real numbers and $a \neq 0$

we have $k(d) = -2d^2 + 15d - 9$, note: $-2d^2 + 15d - 9$ is in dk -plane

Here, we know that $a = -2$, $b = 15$, $c = -9$

Since $a < 0$, we know that the k -coordinate of the vertex is a maximum. However, to find the k -coordinate of our vertex we first need to find the d -coordinate of the vertex by using $d = -\frac{b}{2a} = -\frac{15}{-4} = \frac{15}{4}$. Now that we have the d -coordinate, we can find the k -coordinate

of the vertex by finding $k\left(\frac{15}{4}\right) = -2\left(\frac{15}{4}\right)^2 + 15\left(\frac{15}{4}\right) - 9 = -\frac{225}{8} + \frac{225}{4} - 9 = \frac{153}{8}$. Maximum = $\frac{153}{8}$