3.

Solution

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

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

we have $s(d)=-3d^2+8d-24$, note: $-3d^2+8d-24$ is in ds-plane

Here, we know that $a=-3$, $b=8$, $c=-24$

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 d-coordinate of the vertex by using $d=-\frac{b}{2a}=-\frac{8}{-6}=\frac{4}{3}$ Now that we have the d-coordinate, we can find the s-coordinate of the vertex by finding $s\left(\frac{4}{3}\right)=-3\left(\frac{4}{3}\right)^2+8\left(\frac{4}{3}\right)-24=-\frac{16}{3}+\frac{32}{3}-24=-\frac{56}{3}$ Maximum$=-\frac{56}{3}$