

3.

Solution

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

$v(r) = ar^2 + br + c$ where a , b , and c are real numbers and $a \neq 0$

we have $v(r) = 3r^2 + 10r - 12$, note: $3r^2 + 10r - 12$ is in rv -plane

Here, we know that $a=3$, $b=10$, $c=-12$

Since $a > 0$, we know that the v -coordinate of the vertex is a minimum. However, to find the v -coordinate of our vertex we first need to find the r -coordinate of the vertex by using $r = -\frac{b}{2a} = -\frac{10}{2 \cdot 3} = -\frac{5}{3}$ Now that we have the r -coordinate, we can find the v -coordinate

of the vertex by finding $v(-\frac{5}{3}) = 3(-\frac{5}{3})^2 + 10(-\frac{5}{3}) - 12 = \frac{25}{3} - \frac{50}{3} - 12 = -\frac{61}{3}$ Minimum $= -\frac{61}{3}$