5.

Solution

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

$r(e) = ae^2 + be + c$ where a, b, and c are real numbers and $a \neq 0$

we have $r(e) = -3e^2 + 15e + 14$, note: $-3e^2 + 15e + 14$ is in er-plane

Here, we know that $a = -3$, $b = 15$, $c = 14$

Since $a < 0$,we know that the r-coordinate of the vertex is a maximum.However,to find the r-coordinate of our vertex we first need to find the e-coordinate of the vertex by using $e = -\frac{b}{2a} = -\frac{15}{-6} = \frac{5}{2}$ Now that we have the e-coordinate, we can find the r-coordinate of the vertex by finding $r\left(\frac{5}{2}\right) = -3\left(\frac{5}{2}\right)^2 + 15\left(\frac{5}{2}\right) + 14 = -\frac{75}{4} + \frac{75}{2} + 14 = \frac{131}{4}$ Maximum $= \frac{131}{4}$