6.

Solution

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

$r(w) = aw^2 + bw + c$ where a, b, and c are real numbers and $a \neq 0$

we have $r(w) = -w^2 + 10w + 6$, note: $-w^2 + 10w + 6$ is in wr-plane

Here, we know that $a = -1$, $b = 10$, $c = 6$

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 w-coordinate of the vertex by using $w = -\frac{b}{2a} = -\frac{10}{-2} = 5$ Now that we have the w-coordinate, we can find the r-coordinate

of the vertex by finding $r(5) = -1(5)^2 + 10(5) + 6 = -25 + 50 + 6 = 31$ Maximum=31