6.

Solution

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

$w(y)=ay^2+by+c$ where a, b, and c are real numbers and $a\neq 0$

we have $w(y)=y^2+9y+16$, note: $y^2+9y+16$ is in yw-plane

Here, we know that $a=1$, $b=9$, $c=16$

Since $a>0$,we know that the w-coordinate of the vertex is a minimum. However,to find the w-coordinate of our vertex we first need to find the y-coordinate of the vertex by using $y=-\frac{b}{2a}=-\frac{9}{2}=-\frac{9}{2}$ Now that we have the y-coordinate, we can find the w-coordinate of the vertex by finding $w(-\frac{9}{2})=1(-\frac{9}{2})^2+9(-\frac{9}{2})+16=\frac{81}{4}-\frac{81}{2}+16=-\frac{17}{4}$ Minimum$=-\frac{17}{4}$