2.

Solution

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

$z(x)=ax^2+bx+c$ where a, b, and c are real numbers and $a\neq 0$

we have $z(x)=-2x^2+10x-17$, note: $-2x^2+10x-17$ is in xz-plane

Here, we know that $a=-2$, $b=10$, $c=-17$

Since $a<0$,we know that the z-coordinate of the vertex is a maximum.However,to find the z-coordinate of our vertex we first need to find the x-coordinate of the vertex by using $x=-\frac{b}{2a}=-\frac{10}{-4}=\frac{5}{2}$ Now that we have the x-coordinate, we can find the z-coordinate of the vertex by finding $z\left(\frac{5}{2}\right)=-2\left(\frac{5}{2}\right)^2+10\left(\frac{5}{2}\right)-17=-\frac{25}{2}+25-17=-\frac{9}{2}$ Maximum$=-\frac{9}{2}$