4.

Solution

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

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

we have $g(r)=2r^2+2r-6$, note: $2r^2+2r-6$ is in rg-plane

Here, we know that $a=2$, $b=2$, $c=-6$

Since $a>0$,we know that the g-coordinate of the vertex is a minimum. However,to find the g-coordinate of our vertex we first need to find the r-coordinate of the vertex by using $r=\frac{-b}{2a}=\frac{-2}{4}=-\frac{1}{2}$ Now that we have the r-coordinate, we can find the g-coordinate of the vertex by finding $g(-\frac{1}{2})=2(-\frac{1}{2})^2+2(-\frac{1}{2})-6=\frac{1}{2}-1-6=-\frac{13}{2}$ Minimum$=-\frac{13}{2}$