4.

Solution

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

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

we have $e(y) = -2y^2 + 13y + 19$, note: $-2y^2 + 13y + 19$ is in ye-plane

Here, we know that $a = -2$, $b = 13$, $c = 19$

Since $a < 0$,we know that the e-coordinate of the vertex is a maximum.However,to find the e-coordinate of our vertex we first need to find the y-coordinate of the vertex by using $y = -\frac{b}{2a} = -\frac{13}{-4} = \frac{13}{4}$ Now that we have the y-coordinate, we can find the e-coordinate of the vertex by finding $e(\frac{13}{4}) = -2(\frac{13}{4})^2 + 13(\frac{13}{4}) + 19 = -\frac{169}{8} + \frac{169}{4} + 19 = \frac{321}{8}$ Maximum $= \frac{321}{8}$