4.

Solution

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

$e(m) = am^2 + bm + c$ where a, b, and c are real numbers and $a \neq 0$

we have $e(m) = -2m^2 - 5m + 16$, note: $-2m^2 - 5m + 16$ is in me-plane

Here, we know that $a = -2$, $b = -5$, $c = 16$

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 m-coordinate of the vertex by using $m = -\frac{b}{2a} = -\frac{-5}{-4} = -\frac{5}{4}$ Now that we have the m-coordinate, we can find the e-coordinate of the vertex by finding $e\left(-\frac{5}{4}\right) = -2\left(-\frac{5}{4}\right)^2 - 5\left(-\frac{5}{4}\right) + 16 = -\frac{25}{8} + \frac{25}{4} + 16 = \frac{153}{8}$ Maximum $= \frac{153}{8}$