

4.

## Solution

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

$m(p) = ap^2 + bp + c$  where  $a$ ,  $b$ , and  $c$  are real numbers and  $a \neq 0$

we have  $m(p) = 3p^2 - 15p + 10$ , note:  $3p^2 - 15p + 10$  is in  $pm$ -plane

Here, we know that  $a = 3$ ,  $b = -15$ ,  $c = 10$

Since  $a > 0$ , we know that the  $m$ -coordinate of the vertex is a minimum. However, to find the  $m$ -coordinate of our vertex we first need to find the  $p$ -coordinate of the vertex by using  $p = -\frac{b}{2a} = -\frac{-15}{2 \cdot 3} = \frac{5}{2}$  Now that we have the  $p$ -coordinate, we can find the  $m$ -coordinate

of the vertex by finding  $m(\frac{5}{2}) = 3(\frac{5}{2})^2 - 15(\frac{5}{2}) + 10 = \frac{75}{4} - \frac{75}{2} + 10 = -\frac{35}{4}$  Minimum  $= -\frac{35}{4}$