

1.

## Solution

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

$e(t) = at^2 + bt + c$  where  $a$ ,  $b$ , and  $c$  are real numbers and  $a \neq 0$

we have  $e(t) = 2t^2 - 12t - 12$ , note:  $2t^2 - 12t - 12$  is in  $te$ -plane

Here, we know that  $a=2$ ,  $b=-12$ ,  $c=-12$

Since  $a > 0$ , we know that the  $e$ -coordinate of the vertex is a minimum. However, to find the  $e$ -coordinate of our vertex we first need to find the  $t$ -coordinate of the vertex by using  $t = -\frac{b}{2a} = -\frac{-12}{2 \cdot 2} = 3$  Now that we have the  $t$ -coordinate, we can find the  $e$ -coordinate

of the vertex by finding  $e(3) = 2(3)^2 - 12(3) - 12 = 18 - 36 - 12 = -30$  Minimum = -30