1.

Solution

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

$q(d) = ad^2 + bd + c$ where a, b, and c are real numbers and $a \neq 0$

we have $q(d) = 2d^2 - 4d + 24$, note: $2d^2 - 4d + 24$ is in dq-plane

Here, we know that $a=2$, $b=-4$, $c=24$

Since $a \geq 0$, we know that the q-coordinate of the vertex is a minimum. However, to find the q-coordinate of our vertex we first need to find the d-coordinate of the vertex by using $d = -\frac{b}{2a} = -\frac{-4}{4} = 1$ Now that we have the d-coordinate, we can find the q-coordinate of the vertex by finding $q(1) = 2(1)^2 - 4(1) + 24 = 2 - 4 + 24 = 22$ Minimum=22