3.

Solution

To find the v-intercept, we set q equal to 0, so :

$q(v) = v^2 - 2v - 8 = (-4 + v)(2 + v) = 0$

$-4 + v = 0$ or $2 + v = 0$

$v = 4$ or $v = -2$

So, the v-intercepts are at the points $(4,0)$ and $(-2,0)$