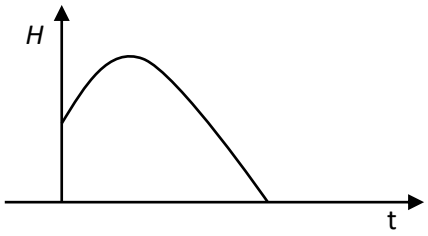
1. A flare is fired and its height *h* metres after *t* seconds is given by the function $h(t) = 20 + 8t - t^2$. Its path is shown in the diagram below.

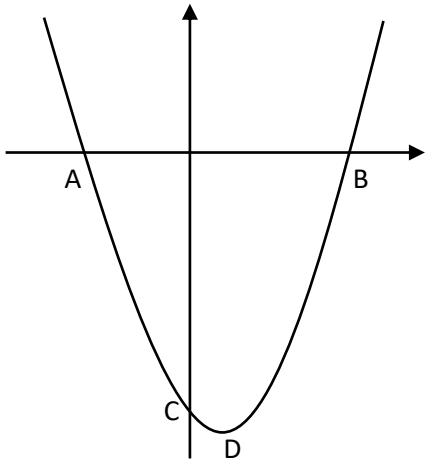


a. From what height was the flare fired?
b. After how many seconds will the flare land?
c. How long will it take the flare to reach its maximum height?
d. Calculate the maximum height.

2. The equation of a quadratic function is $f(x) = 12 - (x - 3)^2$

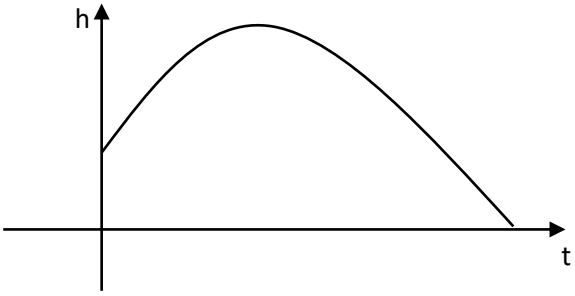
a. State the coordinates and nature of the turning point.
b. Find the coordinates of the point where the graph intercepts the y axis.

3. The graph shown has equation $f(x) = (x + 4)(x - 6)$



a. Find the coordinates of A and B, the roots of the quadratic function.
b. Find the coordinates of C, the point of intercept with the y axis.
c. Find the coordinates of D, the turning point.
d. Write down the equation of the axis of symmetry.

4. An object is thrown into the sea at a height of *h* metres above sea level. Its path after *t* seconds is shown below, modelled by the function $h(t) = 7 + 6t - t^2$.



a. From what height above sea level was the object thrown?
b. How long was the object in the air?
c. After how many seconds did it reach its maximum height?
d. Did the object reach a height of 20 metres? Show all your working.