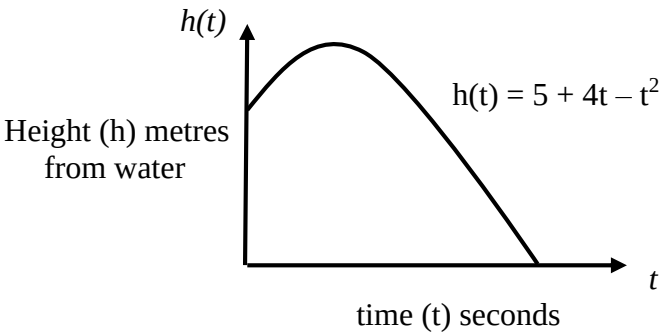
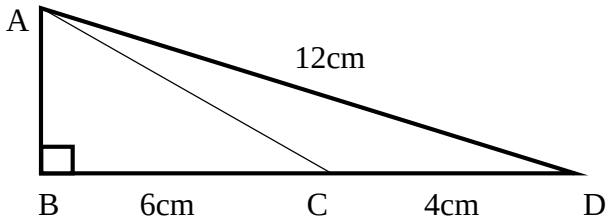
1. After firing a flare for help, its path is modelled on the function h with equation $H(t) = 5 + 4t - t^2$.



a. After how many seconds does the flare land in the water?
b. Calculate the maximum height of the flare.

2. Find the volume of a hemisphere with radius 12cm. Give your answer correct to 3 significant figures.

3. Show that the length of AC in the diagram below is $4\sqrt{5}$.



4. Express $\frac{2p}{q} + \frac{3}{2p}$ as a single fraction.

5. Fully factorise $3x^4 - 3x^2$.

6. Multiply out the brackets and simplify $(x - 4)(x^2 + 6x - 3)$.

7. Solve $2x^2 - x - 15 = 0$.

8. Change the subject of the formula below to g.

$$\frac{q+2}{3g} = \frac{5q}{4}$$

9. Evaluate $a^{1/2}(3a^{-1/2} + 2a^{-3/2})$ when $a = 4$.

10. Find the turning point and the equation of the axis of symmetry of the function

$$f(x) = x^2 + 6x + 8.$$