6 A student wishes to determine the density ρ of lead. She measures the mass and diameter of a small sphere of lead:

$$mass = (0.506 \pm 0.005)\,g$$

$$diameter = (2.20 \pm 0.02)\,mm.$$

What is the best estimate of the percentage uncertainty in her value of ρ?

A 1.9%   **B** 2.0%   **C** 2.8%   **D** 3.7%

7 The graph shows how the velocity v of a firework rocket changes with time t.

At which point on the graph does the rocket have the greatest acceleration?
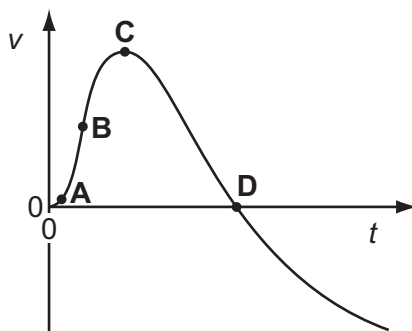
8 On a particular railway, a train driver applies the brake of the train at a yellow signal, a distance of 1.0 km from a red signal, where the train stops.

The maximum deceleration of the train is $0.20\,m\,s^{-2}$.

Assuming uniform deceleration, what is the maximum safe speed of the train at the yellow signal?

A $14\,m\,s^{-1}$ **B** $20\,m\,s^{-1}$ **C** $40\,m\,s^{-1}$ **D** $400\,m\,s^{-1}$

Space for working