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

$$\text{mass} = (0.506 \pm 0.005)\,\text{g}$$

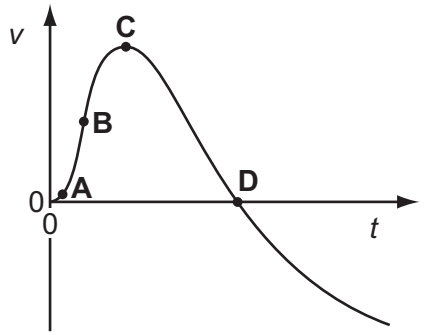
$$\text{diameter} = (2.20 \pm 0.02)\,\text{mm}.$$

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 $0.20\,\text{m s}^{-2}$.

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

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

Space for working