



Show

$$2x^3 + 3x^2 - 4x + 7 = 0$$

has a solution between -3 and -2

$$f(-2) = 11$$

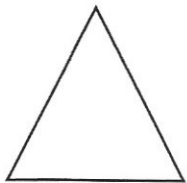
$$f(-3) = -8$$

since there is a change of sign there is a root.

A particle travels 140m in 6.4 seconds. Both measurements are given to 2 significant figures.

Find the upper bound for the speed of the particle

$$\begin{aligned} \text{Max speed} &= \frac{\text{max distance}}{\text{min time}} \\ &= \frac{145}{6.35} = 22.834\dots \text{ m/s} \end{aligned}$$



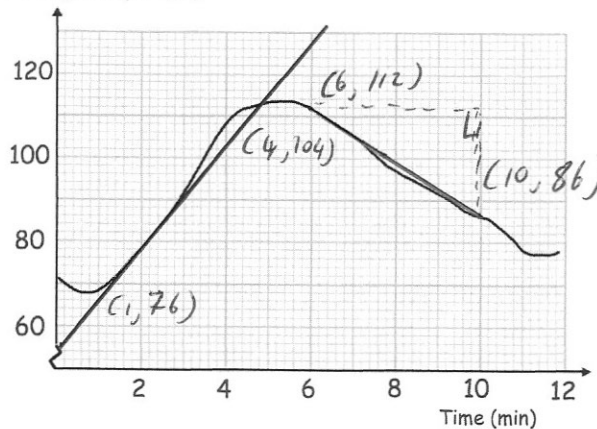
$\sqrt{12}$ cm

$$\begin{aligned} \frac{1}{2} \times \sqrt{12} \times x &= 2\sqrt{6} \\ \sqrt{12} \times x &= 4\sqrt{6} \\ 2\sqrt{3} \times x &= 4\sqrt{6} \\ x &= 2\sqrt{2} \text{ cm} \end{aligned}$$

The triangle has an area of $2\sqrt{6}$ cm²

Find the height of the triangle, x. Give your answer as a simplified surd.

Pulse (beats per min)



Work out the rate at which the pulse is increasing at two minutes. Include units.

$$\frac{104 - 76}{4 - 1} = \frac{28}{3} = 9.3 \text{ beats per min per min} \text{ or beats per min}^2$$

Work out the average rate at which the pulse is decreasing between six minutes and ten minutes. Include units.

$$\begin{aligned} \frac{86 - 112}{4} &= -6.5 \\ &6.5 \text{ beats per min per min} \\ &\text{or beats per min}^2 \end{aligned}$$