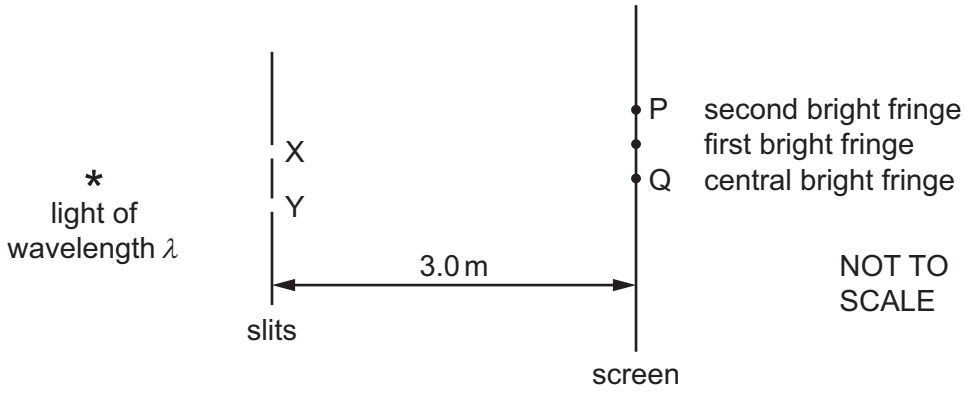
29 The diagram shows an arrangement for demonstrating two-source interference using coherent light of a single wavelength λ.



An interference pattern is observed on a screen 3.0 m away from the slits X and Y, which have a separation of 1.0 mm.

The central bright fringe is at Q, and the **second** bright fringe from the centre is at P.

What is the distance between Q and P?

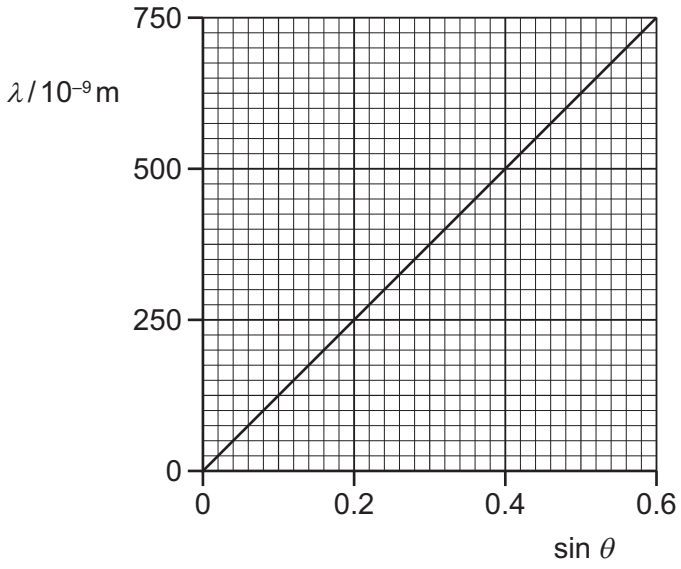
A $6.0 \times 10^{3} \lambda$

B $3.0 \times 10^{3} \lambda$

C $6.7 \times 10^{-4} \lambda$

D $3.3 \times 10^{-4} \lambda$

30 Light of wavelength λ is incident normally on a diffraction grating. The angle between the **second**-order maximum and the normal to the grating is θ. The variation with sin θ of λ is shown on the graph.



How many lines per millimetre are on the diffraction grating?

A 400 mm^{-1} **B** 625 mm^{-1} **C** 800 mm^{-1} **D** 1250 mm^{-1}