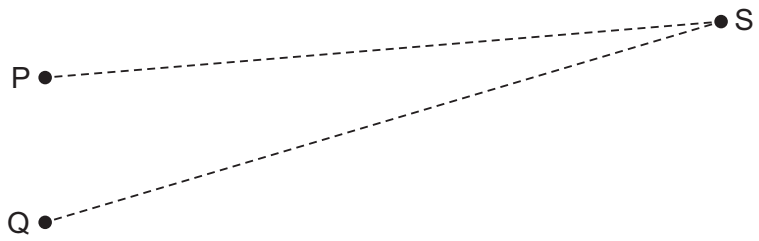
29 Two sources of microwaves P and Q produce coherent waves with a phase difference of 180°. The waves have the same wavelength λ.



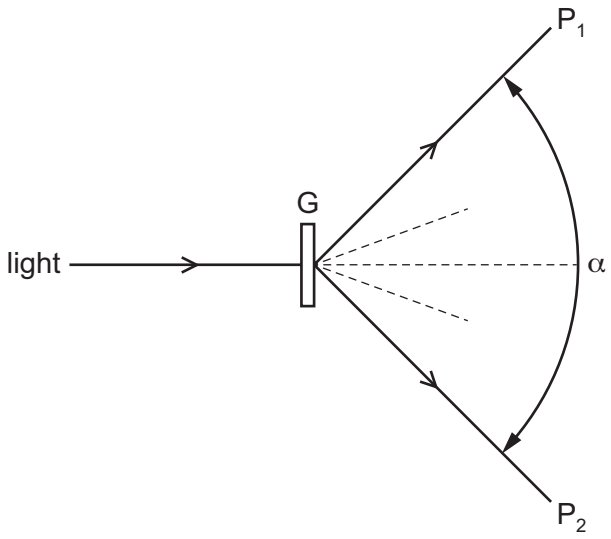
At the point S there is a minimum in the interference pattern produced by waves from the two sources. The distance (QS – PS) is called the path difference.

In the expressions shown, *n* is an integer.

Which expression represents the path difference?

A $n\lambda$ **B** $\frac{1}{2}n\lambda$ **C** $(n + \frac{1}{2})\lambda$ **D** $(2n + \frac{1}{2})\lambda$

30 A parallel beam of monochromatic light of wavelength λ is incident normally on a diffraction grating G. The angle between the directions of the two second-order diffracted beams at P_1 and at P_2 is α, as shown.



What is the spacing of the lines on the grating?

A $\frac{2\lambda}{\sin\alpha}$ **B** $\frac{\lambda}{\sin\alpha}$ **C** $\frac{2\lambda}{\sin(\alpha/2)}$ **D** $\frac{\lambda}{\sin(\alpha/2)}$