

- 7 (a) Figs. 7.1(a) and (b) show plane wavefronts approaching a narrow gap and a wide gap respectively.

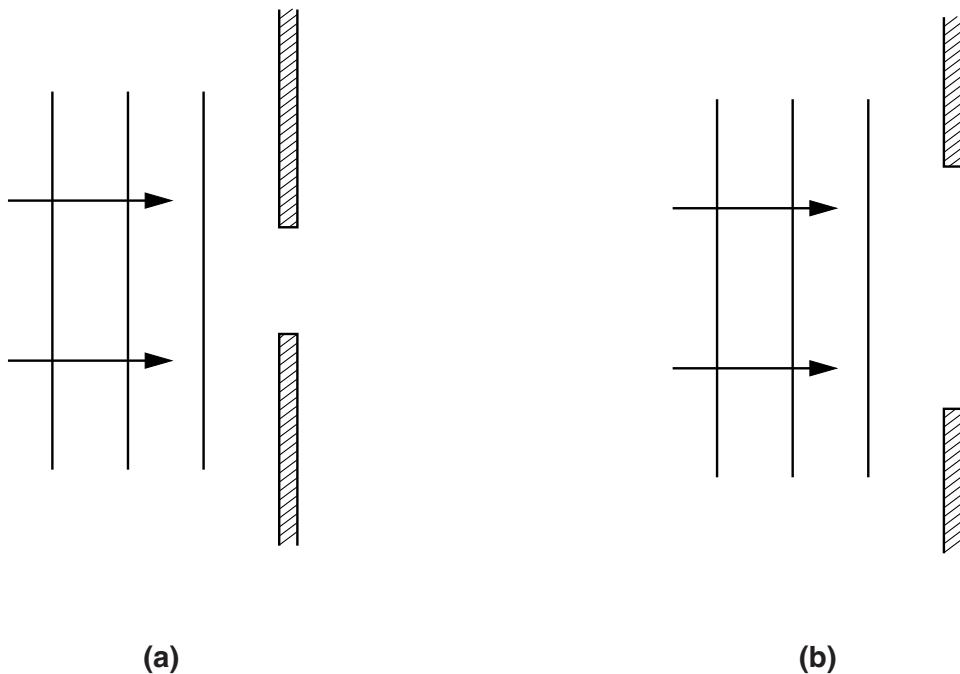


Fig. 7.1

On Figs. 7.1(a) and (b), draw three successive wavefronts to represent the wave after it has passed through each of the gaps. [5]

- (b) Light from a laser is directed normally at a diffraction grating, as illustrated in Fig. 7.2.

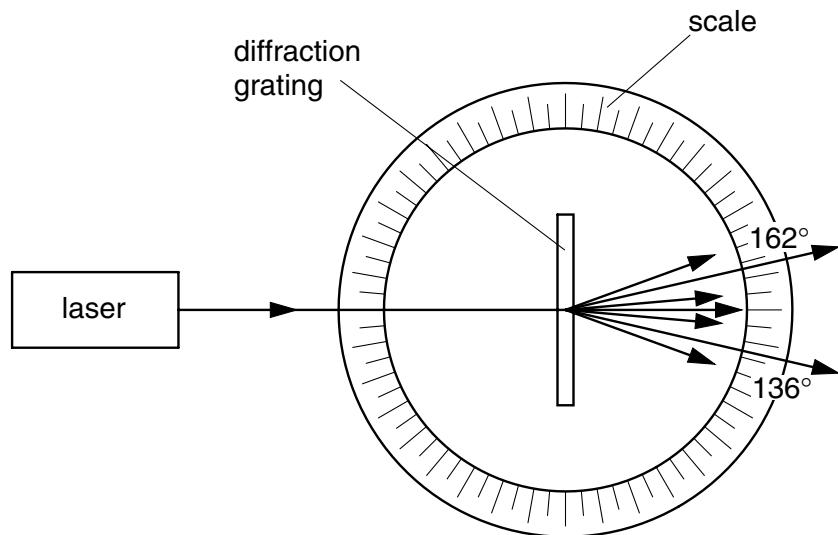


Fig. 7.2

The diffraction grating is situated at the centre of a circular scale, marked in degrees. The readings on the scale for the second order diffracted beams are 136° and 162° .

The wavelength of the laser light is 630 nm.

Calculate the spacing of the slits of the diffraction grating.

$$\text{spacing} = \dots \text{m} \quad [4]$$

- (c) Suggest one reason why the fringe pattern produced by light passing through a diffraction grating is brighter than that produced from the same source with a double slit.

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