

- 5 (a) a progressive wave on a stretched string, state what is meant by *amplitude*.

.....
..... [1]

- (b) Light from a laser has a wavelength of 690 nm in a vacuum.

Calculate the period of the light wave.

period = s [3]

- (c) A two-source interference experiment uses the arrangement shown in Fig. 5.1.

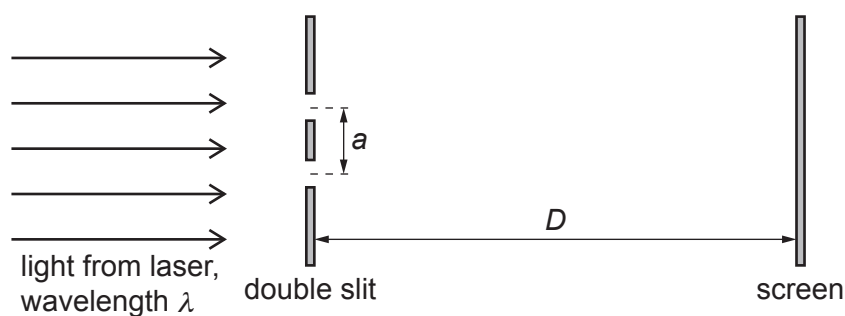


Fig. 5.1 (not to scale)

Light from a laser is incident normally on a double slit. A screen is parallel to the double slit.

Interference fringes are seen on the screen at distance D from the double slit. The separation of the centres of the slits is a . The light has wavelength λ .

The separation x of the centres of adjacent bright fringes is measured for different values of distance D .

The variation with D of x is shown in Fig. 5.2.

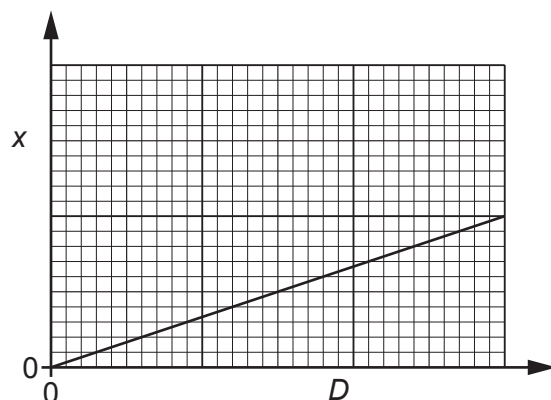


Fig. 5.2

The gradient of the graph is G .

- (i) Determine an expression, in terms of G and λ , for the separation a of the slits.

$$a = \dots\dots\dots [2]$$

- (ii) The experiment is repeated with slits of separation $2a$. The wavelength of the light is unchanged.

On Fig. 5.2, sketch a graph to show the results of this experiment. [2]

[Total: 8]