5 (a) For 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.
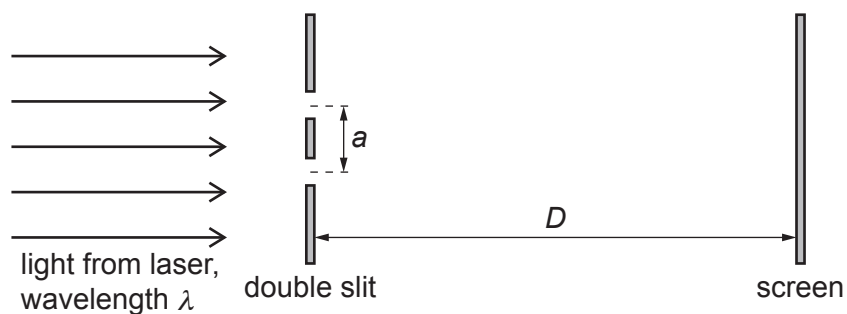

Fig. 5.1 (not to scale)

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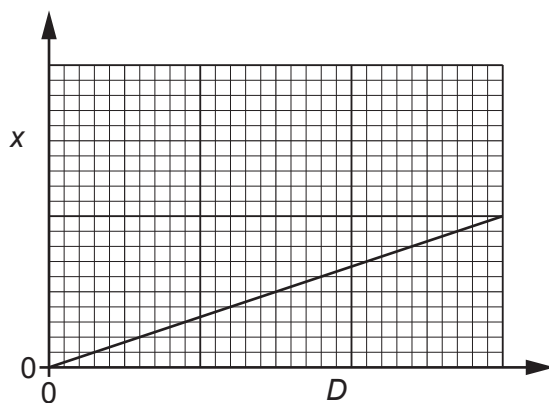
The variation with *D* of *x* is shown in Fig. 5.2.

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 = ... [2]

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

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