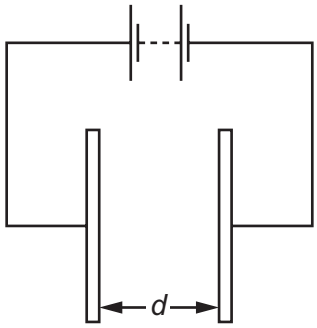
30 In an experiment to demonstrate double-slit interference using light, the distance from the slits to the screen is doubled and the slit separation is halved. The wavelength of the light is kept constant.

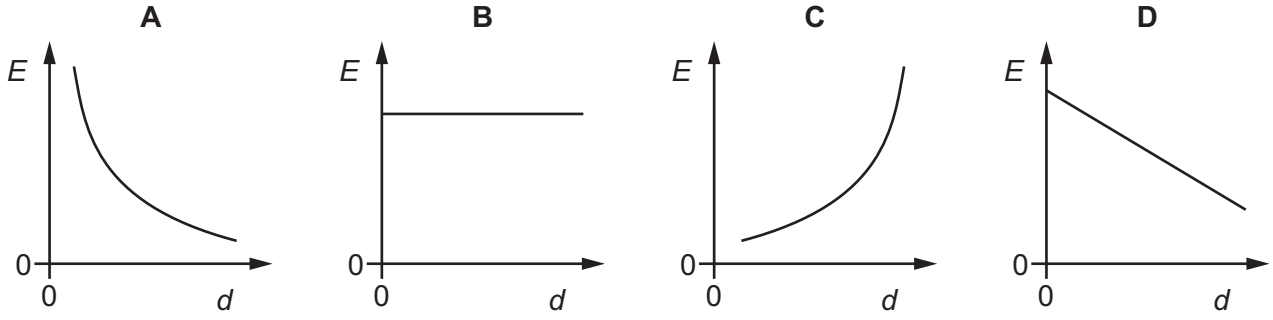
By which factor does the separation of adjacent bright fringes change?

A $\frac{1}{4}$ **B** $\frac{1}{2}$ **C** 2 **D** 4

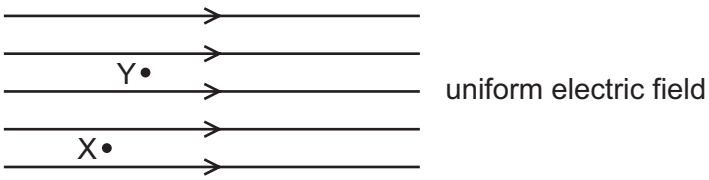
31 The diagram shows two metal plates connected to a constant high voltage.



Which graph shows the variation of the electric field strength *E* midway between the two plates as the distance *d* between the two plates is increased?



32 An electron moves between two points X and Y in a uniform electric field, as shown.



The distance between X and Y is 4.0 cm and the line XY is at an angle of 60° to the direction of the field.

The field exerts the only force on the electron.

The field strength is 100 N C^{-1}.

What is the change in the kinetic energy of the electron as it moves from X to Y?

A –4 eV **B** –2 eV **C** +2 eV **D** +4 eV