

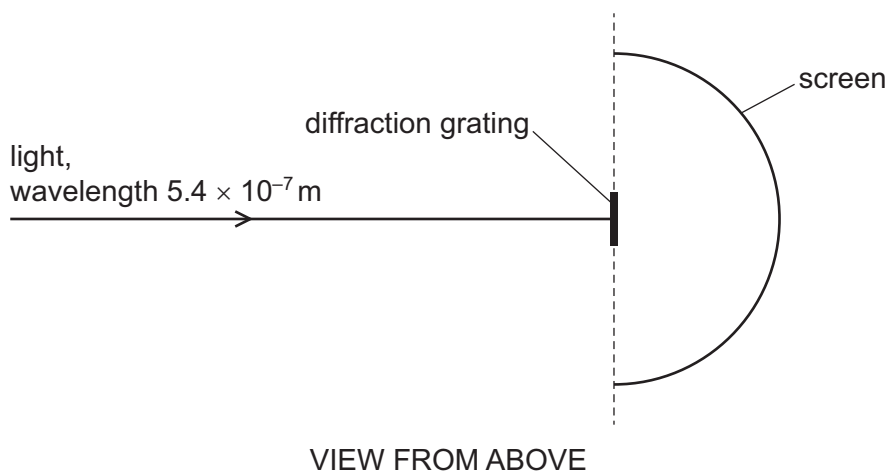
- 29 Light of a single frequency passes through two narrow slits and produces an interference pattern on a screen some distance away. The interference fringes are very close together.

Which change would **increase** the distance between the fringes?

- A Increase the brightness of the light source.
- B Increase the distance between the slits and the screen.
- C Increase the distance between the two slits.
- D Increase the frequency of the light used.

- 30 Light of wavelength $5.4 \times 10^{-7} \text{ m}$ is incident normally on a diffraction grating.

The separation between adjacent lines in the grating is $2.0 \times 10^{-6} \text{ m}$. The light that emerges from the grating falls on a semicircular screen, as shown in the view from above.



The grating is at the centre of the semicircle, and the lines of the grating are vertical.

How many bright dots are formed on the screen?

- A 3
- B 4
- C 6
- D 7

- 31 A straight copper wire of diameter $0.42 \times 10^{-3} \text{ m}$ has a number density of free electrons of $8.5 \times 10^{28} \text{ m}^{-3}$. In a given time interval, a charge of 0.15 C moves through the wire.

What is the average displacement of the free electrons along the wire in this time interval?

- A $3.3 \times 10^{-8} \text{ m}$
- B $2.0 \times 10^{-5} \text{ m}$
- C $8.0 \times 10^{-5} \text{ m}$
- D $2.5 \times 10^{-4} \text{ m}$

- 32 What is the definition of the potential difference (p.d.) across a component?

- A the electrical power supplied to the component
- B the energy transferred to the component per unit charge
- C the product of the current in the component and its resistance
- D the voltage across the component