27 A wave of amplitude a has an intensity of $3.0\,\text{Wm}^{-2}$.

What is the intensity of a wave of the same frequency that has an amplitude $2a$?

A $4.2\,\text{Wm}^{-2}$ **B** $6.0\,\text{Wm}^{-2}$ **C** $9.0\,\text{Wm}^{-2}$ **D** $12\,\text{Wm}^{-2}$

28 Coherent monochromatic light illuminates two narrow parallel slits and the interference pattern that results is observed on a screen some distance beyond the slits.

Which change increases the separation between the dark lines of the interference pattern?

A using monochromatic light of higher frequency

B using monochromatic light of a longer wavelength

C decreasing the distance between the screen and the slits

D increasing the distance between the slits

29 Monochromatic light of wavelength 590 nm is incident normally on a diffraction grating. The angle between the two second-order diffracted beams is 43°.

What is the spacing of the lines on the grating?

A 0.87 µm **B** 1.6 µm **C** 1.7 µm **D** 3.2 µm

30 Which equation is used to define resistance?

A power = $(\text{current})^2 \times$ resistance

B resistivity = resistance $\times$ area $\div$ length

C potential difference = current $\times$ resistance

D energy = $(\text{current})^2 \times$ resistance $\times$ time