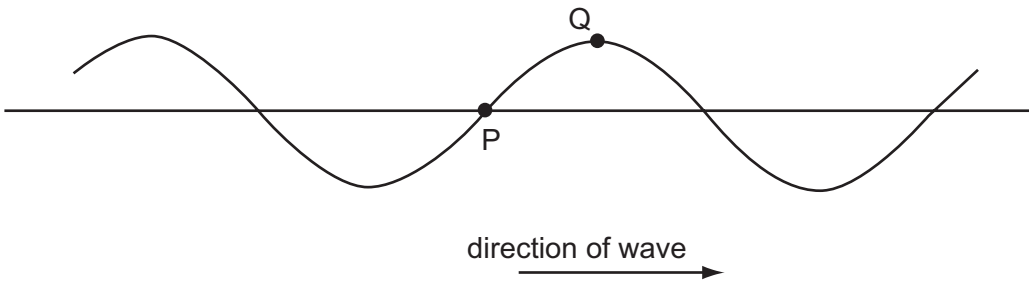
25 The diagram shows a transverse wave on a rope. The wave is travelling from left to right.

At the instant shown, the points P and Q on the rope have zero displacement and maximum displacement respectively.



Which of the following describes the direction of motion, if any, of the points P and Q at this instant?

	point P	point Q
A	downwards	stationary
B	stationary	downwards
C	stationary	upwards
D	upwards	stationary

26 A plane wave of amplitude A is incident on a surface of area S placed so that it is perpendicular to the direction of travel of the wave. The energy per unit time reaching the surface is E.

The amplitude of the wave is increased to $2A$ and the area of the surface is reduced to $\frac{1}{2}S$.

How much energy per unit time reaches this smaller surface?

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

27 What is the approximate range of frequencies of infra-red radiation?

A 1×10^3 Hz to 1×10^9 Hz

B 1×10^9 Hz to 1×10^{11} Hz

C 1×10^{11} Hz to 1×10^{14} Hz

D 1×10^{14} Hz to 1×10^{17} Hz

28 The lines of a diffraction grating have a spacing of 1.6×10^{-6} m. A beam of light is incident normally on the grating. The first order maximum makes an angle of 20° with the undeviated beam.

What is the wavelength of the incident light?

A 210 nm **B** 270 nm **C** 420 nm **D** 550 nm