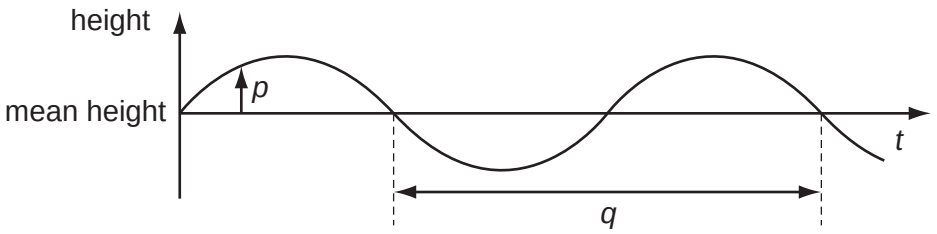
**24** The Young modulus of steel is determined using a length of steel wire and is found to have the value $E$.

Another experiment is carried out using a wire of the same steel, but of twice the length and half the diameter.

What value is obtained for the Young modulus in the second experiment?

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

**25** The graph shows how the height of a water surface at a point in a harbour varies with time $t$ as waves pass the point.

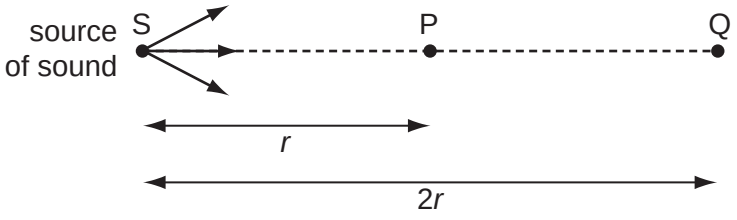



What are $p$ and $q$?

| | $p$ | $q$ |
|---|---|---|
| **A** | displacement | wavelength |
| **B** | displacement | period |
| **C** | amplitude | wavelength |
| **D** | amplitude | period |

**26** The intensity $I$ of a sound at a point P is inversely proportional to the square of the distance $x$ of P from the source of the sound. That is

$$I \propto \frac{1}{x^2}.$$




Air molecules at P, a distance $r$ from S, oscillate with amplitude 8.0 μm.

Point Q is situated a distance $2r$ from S.

What is the amplitude of oscillation of air molecules at Q?

**A** 1.4 μm **B** 2.0 μm **C** 2.8 μm **D** 4.0 μm