24 A trolley is held at rest between two steel springs.



Each spring has an unstretched length of 0.10 m.

Spring P has spring constant 60 N m<sup>-1</sup>. Spring Q has spring constant 120 N m<sup>-1</sup>.

Spring P has an extension of 0.40 m.

What is the extension of spring Q?

- **A** 0.10 m
- **B** 0.20 m
- **C** 0.30 m
- **D** 0.80 m
- 25 A lift is supported by two steel cables, each of length 10 m and diameter 0.5 cm.

The lift drops 1 mm when a man of mass 80 kg steps into the lift.

What is the best estimate of the value of the Young modulus of the steel?

- **A**  $2 \times 10^{10} \, \text{N m}^{-2}$
- **B**  $4 \times 10^{10} \, \text{N m}^{-2}$
- ${\bm C} \quad 2 \times 10^{11} \, N \, m^{-2}$
- ${\bm D} \quad 4 \times 10^{11} \, N \, m^{-2}$

Space for working