

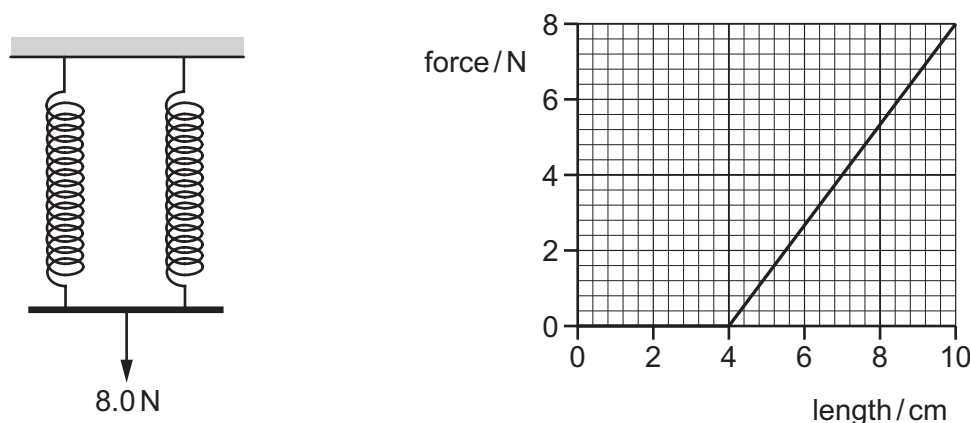
- 19 A metal wire, of cross-sectional area  $A$  and unstretched length  $l$ , is subjected to stress  $\sigma$ . As a result it has strain  $\varepsilon$ .

Which expression gives the Young modulus of the metal?

- A  $\frac{\varepsilon}{\sigma}$       B  $\frac{\varepsilon A}{\sigma l}$       C  $\frac{\sigma}{\varepsilon}$       D  $\frac{\sigma l}{\varepsilon A}$

- 20 Two identical springs are connected in parallel.

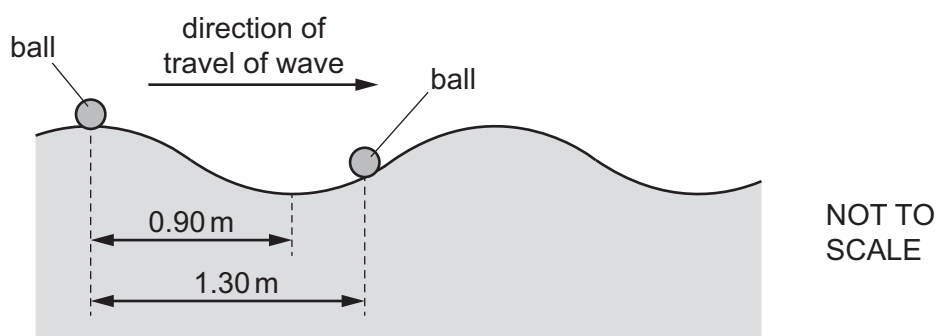
A weight of 8.0 N is hung from the combination, as shown.



The graph shows the variation with length of the force applied to **one** of the springs.

What is the strain energy in **one** of the springs?

- A 0.060 J      B 0.12 J      C 0.14 J      D 0.24 J
- 21 Two balls float on the surface of the sea. The balls are separated by a distance of 1.30 m.
- A wave travels on the surface of the sea so that the balls move vertically up and down.



The distance between a crest and an adjacent trough of the wave is 0.90 m.

What is the phase difference between the two balls?

- A  $55^\circ$       B  $110^\circ$       C  $160^\circ$       D  $260^\circ$