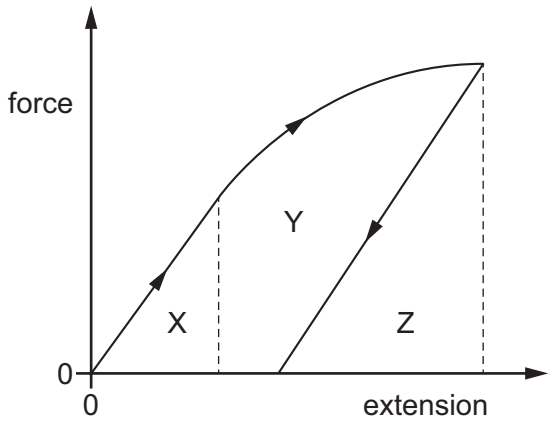
20 A sample of material is stretched by a tensile force to a point beyond its elastic limit. The tensile force is then reduced to zero. The force–extension graph is shown.



Which area represents the net work done on the sample?

A X **B** X + Y **C** Y + Z **D** Z

21 A wire is fixed at one end and is extended by a force F_1 acting on the other end. This causes the wire to have an elastic potential energy of 0.15 J.

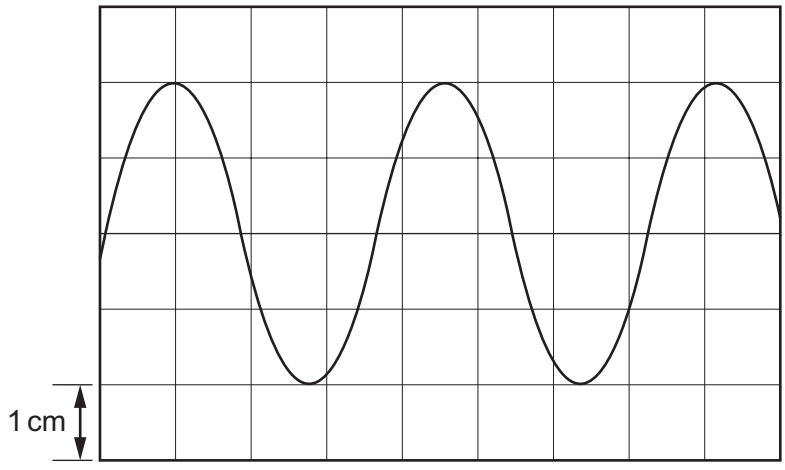
The force applied to the wire is now changed to a force F_2. This causes the wire to have a new elastic potential energy of 0.60 J.

The wire obeys Hooke's law.

What is the relationship between F_1 and F_2?

A $F_1 = 2F_2$ **B** $F_1 = 4F_2$ **C** $2F_1 = F_2$ **D** $4F_1 = F_2$

22 The diagram shows a representation of a wave on the screen of an oscilloscope.



The *y*-gain is set to 3.5 mV cm^{-1}.

What is the amplitude of the wave?

A 0.57 mV **B** 3.5 mV **C** 7.0 mV **D** 14 mV