

**20** A wire X is stretched by a force and gains elastic potential energy  $E$ .

The same force is applied to wire Y of the same material, with the same initial length but twice the diameter of wire X. Both wires obey Hooke's law.

What is the gain in elastic potential energy of wire Y?

**A**  $0.25E$

**B**  $0.5E$

**C**  $2E$

**D**  $4E$