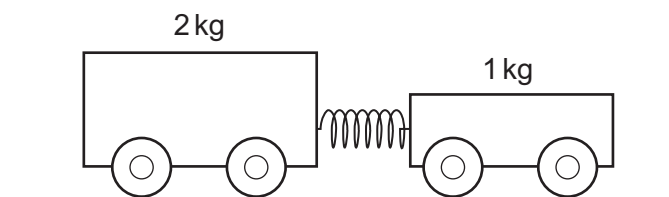**10** Two trolleys are held together on a horizontal surface with a compressed spring between them.
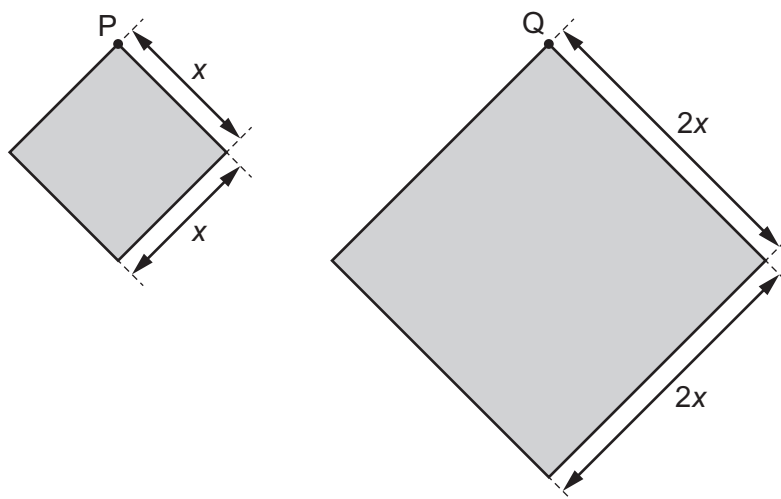

2 kg

1 kg

When they are released, the trolleys lose contact with the spring. The trolley of mass 2 kg moves to the left at a final speed of $2\,\mathrm{m\,s^{-1}}$.

How much elastic potential energy was stored in the spring?

A 4 J **B** 6 J **C** 8 J **D** 12 J

11 A square board, of side length x, hangs freely from a nail P, as shown.

The board has uniform thickness and is made from material of uniform density.

P

x

x

Q

$2x$

$2x$

A second square board, of side length $2x$, is made of the same material and has the same thickness as the original board. This second board is then hung from a nail Q. Nails P and Q are at the same height.

What is the vertical distance between the positions of the centres of gravity of the two boards?

A 0 **B** $\dfrac{x}{\sqrt{2}}$ **C** x **D** $x\sqrt{2}$