

If a spring, extended by 1 cm from its natural length, is stretched by an additional 3 cm, its P.E. increases by a factor of

1. 3x
2. 4x
3. 9x
4. 16x
5. None of the above.

0% 0% 0% 0% 0%



3x

4x

9x

16x

None of the above.

The correct answer is #4 :16x,  
because....

- The PE of a spring is given by  $(PE)_{\text{spr}} = kx^2/2$ , where  $x$  is its extension from its normal length;
- The initial PE is therefore  $(PE)_i = PE(x=1) = k \cdot 1^2/2 = k/2$ ,
- And the final PE is  $(PE)_f = (PE)(x=4) = k \cdot 4^2/2 = 16 \cdot k/2 = 16 \cdot (PE)_i$