

B7 Springs

Numeric answers should ideally be in SI form, without prefixes. For questions with two parts, both answers must be correct for the mark.

- B7.1 A spring with constant 50 N m^{-1} has a load of 12.5 N applied to it. What will be its extension?
- B7.2 A spring of natural length 10.0 cm and spring constant 4.00 N cm^{-1} has a load of 22.0 N placed on it. What is its new length?
- B7.3 If a spring of natural length 1.50 cm stretches to 1.65 cm when a 16 N force is applied, what is its spring constant?
- B7.4 What mass should be suspended from a spring of length 20 cm and spring constant 6.0 kN m^{-1} in order for the spring to be stretched to a length of 22 cm .
- B7.5 A spring has natural length of 8.60 m , and you know that it requires a force of 30 N to stretch it to a length of 9.15 m . Work out the spring constant.
- B7.6 A spring with natural length 0.70 m requires 3.2 N to stretch it by 17.5 cm . Work out the force required to stretch the spring to a length of 83 cm .
- B7.7 Two identical springs, each of natural length 2.0 m and spring constant 80 N m^{-1} are placed in series (that is, one joined to the end of the other), with a weight of 7.5 N suspended from the bottom spring.
- a) State the tension in each spring.
 - b) Work out the total extension of the system.
 - c) If the two identical springs were placed in parallel so that they can share the load, with the same weight of 7.5 N suspended from the combination, work out the tension in each of the springs.
 - d) What is the total length of the system?
- B7.8 If three identical springs were put in series, how would:
- a) the spring constant of the system and
 - b) the total extension of the system compare to just one of the springs on its own with the same force applied?
- B7.9 If five identical springs were placed in parallel, how would:
- a) the stiffness of the system
 - b) the total extension of the system compare to just one of the springs on its own with the same force applied?