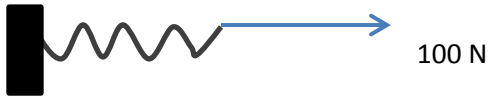


Spring examples

Example 1

A spring with a rest length of 20 cm stretches by 2 cm when pulled by a 100 N force.



- What is the spring constant k ?
- The same spring is used in a game of tug of war. Both sides pull on the spring with a 100 N force. What is the length of the spring?

Example 2

A block is sliding on a frictionless horizontal surface with velocity v . The block is stopped by a spring with spring constant k . When the block stops, the spring is compressed by 1.4 cm.



- If the block were to move with velocity $2v$ and be stopped by the same spring, what would be the compression of the spring?
- if the block had velocity v and the spring was twice as stiff (k becomes $2k$), what would be the compression of the spring?
- In another experiment, the block has mass 200 g, and the spring has spring constant $k = 500 \text{ N/m}$. If the spring is compressed by 2 cm when the block stops, what is the velocity v of the block before it collides with the spring?

Example 3

A mass $m = 10.2 \text{ kg}$ is dropped 15 cm above a spring scale. The rest length of the spring is 20 cm. What is the length of the spring as the mass reaches zero velocity while compressing the spring? The spring constant k is 5000 N/m .

