Answer on Question #55613, Physics / Mechanics | Relativity

In an experiment involving the spiral spring, F is the restoring force and x the extension of the spring. The equation F = - kx gives the relationship between F and x. The graph of F/N against x/cm
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A. passes through the origin

B. has an intercept on the vertical axis

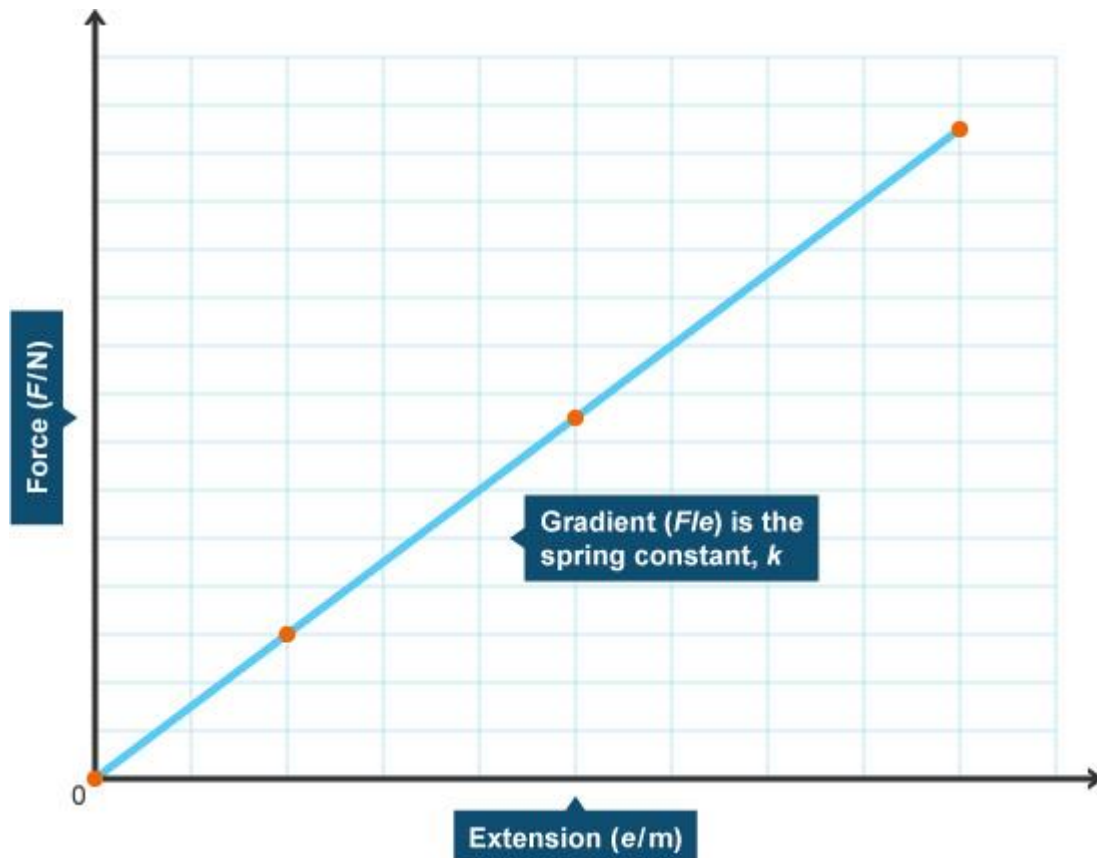C. has an intercept on the horizontal axis

Solution:

The extension of an elastic object is directly proportional to the force applied to it:

$$F = k \cdot e$$

F is the force in newtons, N

k is the 'spring constant' in newtons per metre, N/m

e is the extension in metres, m

The graph of force against extension produces a **straight line that passes through the origin**. The gradient of the line is the spring constant, k. The greater the value of k, the stiffer the spring.

Answer: A. passes through the origin