A spring requires a force of 25 N to produce an extension of 2 cm in it. What is the work done in further extending it by 3 cm.

As long as they are not stretched or compressed beyond their elastic limit, most springs obey Hooke's law, which states that the force with which the spring pushes back is linearly proportional to the distance from its equilibrium length:

$$F = -kx$$

where

x is the displacement vector – the distance and direction the spring is deformed from its equilibrium length.

F is the resulting force vector – the magnitude and direction of the restoring force the spring exerts

k is the rate, spring constant or force constant of the spring, a constant that depends on the spring's material and construction. The negative sign indicates that the force the spring exerts is in the opposite direction from its displacement

Therefore:

$$k = \left|\frac{F}{x}\right| = \frac{25N}{0.02m} = 1250\frac{N}{m}$$

Then the work done to stretch the spring a distance x is:

$$A = \frac{kx^2}{2} = \frac{1}{2}1250\frac{N}{m} * (0.03m)^2 = 0.5625\,J$$

Answer: $0.5625\,J$