

For the work of stretching a spring, write all answers in **foot-pounds (ft-lb)**.

4. A spring has a natural length of 12 inches. A force of 150 lb is required to stretch the spring to 21 inches (9 inches beyond its natural length). How much work is done in stretching the spring from

a) What is the spring constant,  $k$ ?

b) How much work is done in stretching the spring from

i) 12 inches to 18 inches?

ii) 15 inches to 21 inches?

5. The work required to stretch a spring 6 inches beyond its natural length is 90 ft-lb.

a) What is the spring constant,  $k$ ?

b) How much work is done in stretching the spring from 6 inches beyond its natural length to 10 inches beyond its natural length?

7. A 20-lb weight is being raised by a 60-foot rope weighing  $\frac{1}{2}$  lb/ft. Determine the work needed to lift the weight 20 feet.
8. A ship's anchor weighs 1,000 pounds and the anchor chain weighs 50 lb/ft. What is the work done in pulling up the anchor if 100 feet of chain are out?