

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?
6. (Deleted)
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?