

7.5 Work

Name:

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P 2. An electric hoist lifts a 2500-pound car 6 feet. Determine the work done by the constant force.

P 4. The locomotive of a freight train pulls its car with a constant force of 9 tons a distance of one-half mile.

P 6. A force of 250 newtons stretches a spring 30 centimeters. How much work is done in stretching the spring from 20 centimeters to 50 centimeters?

P 8. An overhead garage door has two springs, one on each side of the door. A force of 15 pounds is required to stretch each spring 1 foot. Because of the pulley system, the springs stretch only one-half the distance the door travels. The door moves a total of 8 feet, and the springs are at their natural length when the door is open. find the work done by the pair of springs.

P 10. Seven and one-half foot-pounds of work is required to compress a spring 2 inches from its natural length. Find the work required to compress the spring an additional one-half inch.

P 15. A rectangular tank with base 4 feet by 5 feet and height of 4 feet is full of water. The water weighs 62.4 pounds per cubic foot. How much work is done in pumping the water out over the top edge in order to empty (a) half of the tank and (b) all of the tank?

P 17. A cylindrical water tank 4 meters high with radius 2 meters is buried so that the top of the tank is 1 meter below ground level. How much work is done in pumping a full tank of water up to ground level? (The water weighs 9800 newtons per cubic meter.)

P 19. An open tank has the shape of a right circular cone. The tank is 8 feet across the top and 6 feet high. How much work is done in emptying the tank by pumping the water over the top edge?

P 26. Consider a 20-foot chain that weighs 3 pounds per foot hanging from a winch 20 feet above ground level. Find the work done by the winch in winding up one-third of the chain.

P 28. Consider a 20-foot chain that weighs 3 pounds per foot hanging from a winch 20 feet above ground level. Find the work done by the winch in winding up the entire chain with a 500-pound load attached to it.