Lecture Example Problem

Lake Point Tower in Chicago is the tallest apartment building in the United States (although not the tallest building in which there are apartments). Suppose you take the elevator from street level to the roof of the building. The elevator moves almost the entire distance at constant speed, so that it does 1.15×10^5 J of work on you as it lifts the entire distance. If your mass is 60.0 kg, how tall is the building? Ignore the effects of friction.

1. The *Warszawa Radio* mast in Warsaw, Poland, is 646 m tall, making it the tallest human-built structure. Suppose a worker raises some tools to the top of the tower by means of a small elevator. If 2.15×10^5 J of work is done in lifting the tools, what is the force exerted on them?



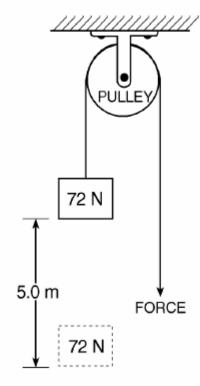




Chapter 5.1 Introduction to Work

Class Practice Problems

In the diagram below, 400. joules of work is done raising a 72-newton weight a vertical distance of 5.0 meters.



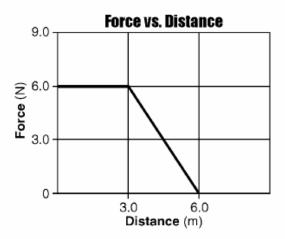
How much work is done to overcome friction as the weight is raised?

2.

How much work is done on a downhill skier by an average braking force of 9.8 × 10² newtons to stop her in a distance of 10. meters?

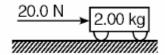


 A box is pushed to the right with a varying horizontal force. The graph below represents the relationship between the applied force and the distance the box moves.



What is the total work done in moving the box 6.0 meters?

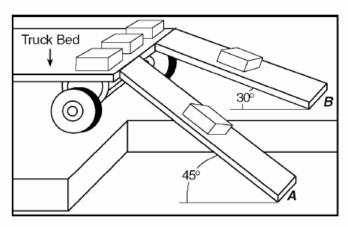
4. In the diagram below, a 20.0-newton force is used to push a 2.00-kilogram cart a distance of 5.00 meters.



What is the work done on the cart?

A) the same

5. The diagram below shows two identical wooden planks, A and B, at different incline angles, used to slide concrete blocks from a truck.



Compared to the amount of work done against friction by a block sliding down plank A, the work done against friction by a block sliding down plank B is

B) more C) less