

Problem 5A

Work

Fill each blank below with the word or phrase that completes the statement.

1. The total work done on an object is the _____ of the work done by the individual forces.
2. Positive work is done when _____.
3. The work done by a force parallel to the displacement is determined by multiplying the _____ of the force by the _____.
4. The difference between positive and negative work is _____.
5. Positive and work both occur parallel to the _____.
6. No work is done when the _____ is perpendicular to the _____.
7. What is the equation for determining the amount of work done on an object when the force is applied at an angle? _____

**12. A wagon is pulled 45 m along a level road at constant velocity. Find the amount of work done on the wagon by a force of 85 N that is applied to the handle and that makes an angle of 20.0° with the horizontal.

13. A piano is lifted 3.0 m vertically. Determine the work done on the piano if its mass is 750 kg.

**14. Determine the work done on a sled that is pulled 20.0 m by a 105 N force applied at an angle of 50° to the horizontal.

15. A 34.5 kg box with an initial velocity of 10.0 m/s slides to a stop along a level road. If the displacement of the box is 17.5 m, determine the force of friction on the box and the work done to stop it.

WORK

The largest palace in the world is the Imperial Palace in Beijing, China. The palace covers a rectangle 750 m long by 960 m wide. If you were to push a lawn mower around the perimeter of such an area, applying a constant horizontal force of 60.0 N, what amount of work would you do?

1. With an overall height of 195 m, 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 live on the top floor of the building and your mass is 60.0 kg. How much work is done on you by the force of gravity as you ride the elevator from the top floor to the ground floor?

2. In 1985 in San Antonio, Texas, an entire hotel building was moved several blocks on 36 dollies. The mass of the building was about 1.45×10^6 kg. Suppose the amount of work done on the building was 100 Mega J and the resistive force that had to be overcome was just 2.00 percent of the building's weight. How far was the building moved?

3. A hummingbird has a mass of about 1.7 g. If the hummingbird ascends straight up with a net acceleration of 1.2 m/s^2 , how much work does it do over a distance of 8.0 m?