

How to Compute Work...

In elementary physics, the **work** W done by a constant force \mathbf{F} in moving an object from point A to point B is defined as:

$$W = \|\vec{F}\| \|\vec{AB}\| \cos \theta$$

Note:

work is often measured in foot-pounds or joules (newton-meters).

Ex.1) A child pulls a sled on level ground by exerting a force of 30 pounds on a rope that makes an angle of 35° with the horizontal. How much work is done pulling the sled 200 ft?

Ex.2) A wagon is pulled along level ground by exerting a force of 40 pounds on a handle that makes an angle of 32° with the horizontal. How much work is done pulling the wagon 100 ft?

Ex.3) Find the work done when a crane lifts a 6000-pound boulder through a vertical distance of 12 feet.

Ex.4) A force of 60 pounds on a rope is used to pull a box up a ramp inclined at 12° from the horizontal. The rope attached to the box forms an angle of 38° with the horizontal. How much work is done pulling the box 20 feet along the ramp?