

Physics 101
Quiz # 4
Chapter 7

Name : Solution

Id :

Sec. # :

1. A horse pulls a cart with a force of 40 N at an angle of 30° above the horizontal and moves along at a speed of 6.0 m/s.
(a) How much work does the force do in 10.0 minutes?

$$W = \vec{F} \cdot \vec{d} = Fd \cos \theta$$

The distance that the horse will cover in 10 minutes is

$$d = vt = 6 \frac{\text{m}}{\text{s}} \times 10 \text{ min} \times \frac{60 \text{ s}}{1 \text{ min}} = 3600 \text{ m}$$

$$\Rightarrow W = 40 \times 3600 \times \cos 30 = 1.2 \times 10^5 \text{ J}$$

- (b) What is the average power of the force?

$$\bar{P} = \frac{W}{\Delta t} = \frac{1.2 \times 10^5}{10 \times 60} = 200 \text{ J/s}$$