WORK AND ENERGY

1. The block below is pulled a distance of 2.50 m. How much work is done by the force? Show your work and include units.

\[ F = 4.50 \text{ N} \]

Answer: ____

2. Now the force acts in a direction 30° above the horizontal as shown below. If the block is again moved 2.50 m, how much work is done by the force? Show your work and include units.

\[ F = 4.50 \text{ N} \]

Answer: ____

3. Two objects of different mass start from rest, are pulled by the same magnitude net force, and are moved through the same distance. The work done on object 1 is 500 J. After the force has pulled each object, object 1 moves twice as fast as object 2. Answer the following questions and show your work.

How much work is done on object 2? ____

What is the kinetic energy of object 1 after being pulled? ____

What is the kinetic energy of object 2 after being pulled? ____
What is the ratio of the mass of object 1 to the mass of object 2?

4. An object of mass 0.550 kg is lifted from the floor to a height of 3.50 m at a constant speed.
   How much work is done by the lifting force (include units)?
   How much work is done by the Earth on the object?
   What is the net work done on the object?
   What is the change in kinetic energy of the object?
   Are your results consistent with the work-energy principle? Explain.

5. If the object in Question 4 is released from rest after it is lifted, what is its kinetic energy just before it hits the floor? What is its velocity? Show your work and include units.
   Answers: Kinetic energy: _____ Velocity: _____

6. A force acts on an object of mass 0.425 kg. The force varies with position as shown in the graph that follows.
Find the work done by the force in moving the object from 0.40 m to 1.20 m. Explain your calculation and give units.

Answer:_____

7. Assuming that there is no friction and that the object in Question 6 starts from rest at 0.40 m, what is the object's kinetic energy when it reaches 1.20 m? Show your calculation and give units.

Answer:_____

8. What is the velocity of the object in Question 6 when it reaches 1.20 m? Show your calculation and give units.

Answer:_____