Work Energy and Power pre-class assignment

Due: 11:59pm on Thursday, June 30, 2022

You will receive no credit for items you complete after the assignment is due. Grading Policy

Prelecture Concept Question 6.01

Part A

A graph depicts force versus position. What represents the work done by the force over the given displacement?

ANSWER:

- ○ The work done is equal to the product of the maximum force times the maximum position.
- ○ The work done is equal to length of the curve.
- ○ The work done is equal to the slope of the curve.
- ◉ The work done is equal to the area under the curve.
- ○ Work cannot be determined from this type of graph.

Correct

Prelecture Concept Question 6.03

Part A

If the net work done on an object is positive, what can you conclude about the object's motion?

ANSWER:

- ○ The object is slowing down.
- ◉ The object is speeding up.
- ○ The object is at rest; its position is constant.
- ○ The object is moving with a constant velocity.

Correct

Prelecture Concept Question 6.05

Part A

A ball is thrown straight upward. How does the sign of the work done by gravity while the ball is traveling upward compare with the sign of the work done by gravity while the ball is traveling downward?

ANSWER:

- ○ Work done by gravity is positive while the ball is traveling both upward and downward.
- ○ Work done by gravity is positive while the ball is traveling upward and negative while the ball is traveling downward.
- ◉ Work done by gravity is negative while the ball is traveling upward and positive while the ball is traveling downward.
- ○ Work done by gravity is negative while the ball is traveling both upward and downward.

Correct

Prelecture Concept Question 6.06

Part A

An object weighing 20 N moves horizontally toward the right a distance of 5.0 m. What is the work done on the object by the force of gravity?

ANSWER:

- ○ The work done on the object by the force of gravity is 50 J.
- ◉ The work done on the object by the force of gravity is zero joules.
- ○ The work done on the object by the force of gravity is 4.0 J.
- ○ The work done on the object by the force of gravity is 0.25 J.
- ○ The work done on the object by the force of gravity is 100 J.

Correct

Prelecture Concept Question 6.02

Part A

If the net work done on an object is zero, what can you determine about the object's kinetic energy?

ANSWER:

- (•) The object's kinetic energy remains the same.
- ( ) The object's kinetic energy is zero.
- ( ) The object's kinetic energy is increasing.
- ( ) The object's kinetic energy is decreasing.

Correct

Exercise 6.32

A 37.0 kg crate is initially moving with a velocity that has magnitude 3.53 $\mathrm{m/s}$ in a direction 37.0 $^\circ$ west of north.

Part A

How much work must be done on the crate to change its velocity to 5.76 $\mathrm{m/s}$ in a direction 63.0 $^\circ$ south of east?

Express your answer to three significant figures and include the appropriate units.

ANSWER:

W = 383 J

Correct

Exercise 6.8

A loaded grocery cart is rolling across a parking lot in a strong wind. You apply a constant force $\vec{F} = (\ 31\ \mathrm{N}\ )\hat{i} - (\ 43\ \mathrm{N}\ )\hat{j}$ to the cart as it undergoes a displacement $\vec{s} = (-\ 9.0\ \mathrm{m}\ )\hat{i} - (\ 3.7\ \mathrm{m}\ )\hat{j}$.

Part A

How much work does the force you apply do on the grocery cart?

Express your answer using three significant figures.

ANSWER:

W = -120 J

Correct

Exercise 6.2

Using a cable with a tension of 1410 N , a tow truck pulls a car 5.00 km along a horizontal roadway.

Part A

How much work does the cable do on the car if it pulls horizontally?

Express your answer with the appropriate units.

ANSWER:

W = 7.05×10^{6} J

Correct

Part B

How much work does the cable do on the car if it pulls at 35.0° above the horizontal?

Express your answer with the appropriate units.

ANSWER:

W = 5.78×10^{6} J

Correct

Part C

How much work does the cable do on the tow truck if it pulls horizontally?

Express your answer with the appropriate units.

ANSWER:

$W = -7.05\times10^{6}\ \text{J}$

Correct

Part D

How much work does the cable do on the tow truck if it pulls at 35.0° above the horizontal?

Express your answer with the appropriate units.

ANSWER:

$W = -5.78\times10^{6}\ \text{J}$

Correct

Part E

How much work does gravity do on the car in part A?

Express your answer with the appropriate units.

ANSWER:

$W = 0\ \text{J}$

Correct

Exercise 6.15

On a farm, you are pushing on a stubborn pig with a constant horizontal force with magnitude 31.7 N and direction 37.0° counterclockwise from the $+x$-axis.

Part A

How much work does this force do during a displacement of the pig that is $\vec{s} = (5.00\ \text{m})\hat{\imath}$?

Express your answer with the appropriate units.

ANSWER:

W = 127 J

Correct

Part B

How much work does this force do during a displacement of the pig that is $\vec{s} = -(6.00\ \text{m})\hat{\jmath}$?

Express your answer with the appropriate units.

ANSWER:

W = -114 J

Correct

Part C

How much work does this force do during a displacement of the pig that is $\vec{s} = -(2.00\ \text{m})\hat{\imath} + (4.00\text{m})\hat{\jmath}$?

Express your answer with the appropriate units.

ANSWER:

W = 25.7 J

Correct

Score Summary:

Your score on this assignment is 100%.
You received 100 out of a possible total of 100 points.