**1.**

**[1/1 Points]**DETAILSPREVIOUS ANSWERS**OSCOLPHYS2016ACC 7.4.P.022.**

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

**question**

A 4.50 **✕** 105 kg subway train is brought to a stop from a speed of 0.500 m/s in 0.900 m by a large spring bumper at the end of its track. What is the force constant *k* of the spring (in N/m)? (Enter a number.)  
  N/m

**2.**

**[4/4 Points]**DETAILSPREVIOUS ANSWERS**OSCOLPHYS2016ACC 7.4.XP.001.**

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

**question**

A 1.8 kg mass starts from rest at point A and moves along the *x*-axis subject to the potential energy shown in the figure below.

Chart, line chart

Description automatically generated

A curve is plotted in the first quadrant of a coordinate plane, with the horizontal axis (in units of m) labeled *x* and the vertical axis (in units of J) labeled *P* *E*.

* The curve starts at point A (0, 30), goes down and to the right with decreasing slope magnitude, passes through point (2, 15), and continues up and to the right with decreasing slope magnitude until it reaches a minimum at point B (4, 5).
* From point B, the curve continues up and to the right with increasing slope, passes through point (5, 15), and continues up and to the right with decreasing slope until it reaches a maximum at point C (6, 20).
* From point C, the curve continues down and to the right with increasing slope magnitude, passes through point (7, 18), and continues down and to the right with decreasing slope magnitude until it reaches a minimum at point D (8, 15).
* From point D, the curve continues up and to the right with increasing slope, passes through point (9, 22), continues up and to the right, and passes through point E (10, 30) before exiting the viewing field.

(a)

Determine the speed (in m/s) of the mass at points B, C, D. (For each answer, enter a number.)

point B  m/s

point C  m/s

point D  m/s

(b)

Determine the turning points for the mass. (Select all that apply.)

point A

point B

point C

point D

point E

**3.**

**[3/3 Points]**DETAILSPREVIOUS ANSWERS**OSCOLPHYS2016 7.4.WA.029.**

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

You have a light spring which obeys Hooke's law. This spring stretches 2.82 cm vertically when a 2.60 kg object is suspended from it. Determine the following.

(a)

the force constant of the spring (in N/m)

  N/m

(b)

the distance (in cm) the spring stretches if you replace the 2.60 kg object with a 1.30 kg object

  cm

(c)

the amount of work (in J) an external agent must do to stretch the spring 7.50 cm from its unstretched position

  J

**4.**

**[3/3 Points]**DETAILSPREVIOUS ANSWERS**OSCOLPHYS2016ACC 7.5.P.025.**

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

**question**

(a)

How high (in m) a hill can a car coast up (engine disengaged) if friction is negligible and its initial speed is 78.0 km/h? (Enter a number.)  
  m

(b)

If, in actuality, a 750 kg car with an initial speed of 78.0 km/h is observed to coast up a hill to a height 11.0 m above its starting point, how much thermal energy (in J) was generated by friction? (Enter a number.)  
  J

(c)

What is the average force of friction (down the slope) if the hill has a slope 2.5° above the horizontal? (Enter your answer in N. Enter a number.)  
  N

**5.**

**[1/1 Points]**DETAILSPREVIOUS ANSWERS**OSCOLPHYS2016 7.5.WA.036.**

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A 71.6-kg boy is surfing and catches a wave which gives him an initial speed of 1.60 m/s. He then drops through a height of 1.58 m, and ends with a speed of 8.51 m/s. How much nonconservative work (in kJ) was done on the boy?

  kJ

**6.**

**[1/1 Points]**DETAILSPREVIOUS ANSWERS**OSCOLPHYS2016 7.6.WA.049.**

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A man on a motorcycle plans to make a jump as shown in the figure.

Diagram

Description automatically generated

If he leaves the ramp with a speed of 30.5 m/s and has a speed of 28.8 m/s at the top of his trajectory, determine his maximum height (*h*) (in m) above the end of the ramp. Ignore friction and air resistance.

  m

**7.**

**[6/6 Points]**DETAILSPREVIOUS ANSWERS**OSCOLPHYS2016 7.6.WA.052.**

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A 6.16 kg object falls freely (ignore air resistance), after being dropped from rest. Determine the initial kinetic energy (in J), the final kinetic energy (in J), and the change in kinetic energy (in J) for the following.

(a)

the first meter of the fall

initial kinetic energy  J

final kinetic energy  J

change in kinetic energy  J

(b)

the second meter of the fall

initial kinetic energy  J

final kinetic energy  J

change in kinetic energy  J