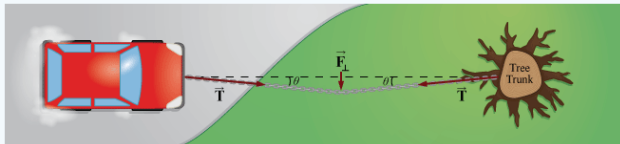


Physics Problem Set 7 - Week 8 (5762137)

Question 1 2 3 4 5 6 7 8

1. Question Details OSColPhys1 4.P.042.WA. [2707381]

Suppose your car was mired deeply in the mud and you wanted to use the method illustrated in the figure below to pull it out.



(a) What force would you have to exert perpendicular to the center of a rope to produce a force of 12,000 N on the car if the angle is $\theta = 2.10^\circ$? (Enter the magnitude only.)

N

(b) Real ropes stretch under such forces. What force would be exerted on the car if the angle increases to 7.00° and you still apply the force found in part (a) to its center? (Enter the magnitude only.)

N

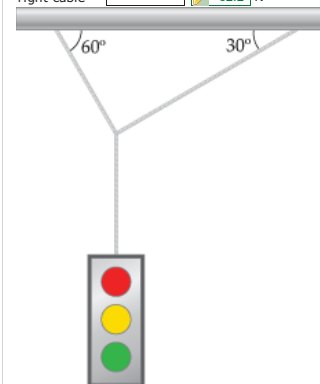
Supporting Materials

Physical Constants

2. Question Details OSColPhys1 4.P.044.WA. [2707297]

A 12.7-kg traffic light is suspended from two cables as shown in the figure below. Find the tension in each cable.

left cable N
right cable N



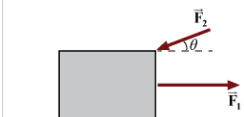
Supporting Materials

Physical Constants

3. Question Details OSColPhys1 4.P.056.WA. [2707259]

A block is acted on by two forces as shown in the diagram below. If the magnitudes of the forces are $F_1 = 49.0$ N and $F_2 = 27.5$ N, what are the magnitude and direction of the acceleration of the block? Let $m = 8.00$ kg and $\theta = 39.5^\circ$.

magnitude m/s²
direction



Supporting Materials

Physical Constants

4. Question Details OScolPhys1 4.P.055.WA. [2707289]

A skier speeds down a smooth ski slope which is at an angle of $\theta = 22^\circ$ with the horizontal. The mass of the skier is 59 kg. Take the downhill direction to be positive and uphill to be negative.

- (a) What net force is acting on the skier? (Indicate the direction with the sign of your answer.)
 N
- (b) What is the acceleration experienced by the skier? (Indicate the direction with the sign of your answer.)
 m/s^2
- (c) How does the net force experienced by the skier change if the ski slope becomes steeper?
 - increases
 - decreases
 - remains the same

Supporting Materials

[Physical Constants](#)

5. Question Details OScolPhys1 4.P.054.WA. [2707430]

A mover has to move a heavy sofa of mass 103 kg to the second floor of the house. He uses a rope to pull the sofa up a ramp from the first to the second floor. As he pulls the sofa he makes sure that the rope is parallel to the surface of the ramp which is at 30.0° to the horizontal. If friction between the sofa and the ramp is negligible, and the sofa has an acceleration of $0.900 m/s^2$, find the tension in the rope.

N

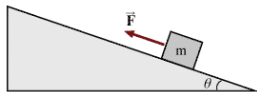
Supporting Materials

[Physical Constants](#)

6. Question Details OScolPhys1 4.P.050.WA. [2707356]

The block in the figure below has a mass of 5.6 kg and it rests on an incline of angle θ . You pull on the rope with a force $F = 37 N$. Assume the incline is smooth and determine the angle of the incline if the block moves with constant speed.

$^\circ$

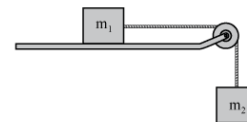


Supporting Materials

[Physical Constants](#)

7. Question Details OScolPhys1 4.P.063.WA. [2707423]

A block of mass $m_1 = 42.2 kg$ on a horizontal surface is connected to a mass $m_2 = 19.3 kg$ that hangs vertically as shown in the figure below. The two blocks are connected by a string of negligible mass passing over a frictionless pulley. Assume that the horizontal surface is smooth.



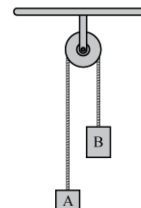
- (a) What is the acceleration of the hanging mass? (Enter the magnitude only.)
 m/s^2
- (b) Determine the tension in the cord. (Enter the magnitude only.)
 N

Supporting Materials

[Physical Constants](#)

8. Question Details OScolPhys1 4.P.058.WA. [2707318]

A pulley and string arrangement is used to connect two objects A and B as shown in the diagram below. Here, $m_A = 2.95 kg$ and $m_B = 7.70 kg$. The string connecting the two objects is of negligible mass and the pulley is frictionless. The objects start from rest and move with constant acceleration.



- (a) What is the magnitude of the acceleration of each of the objects?
 m/s^2
- (b) What is the magnitude of the tension in the string?
 N
- (c) Through what distance will the two objects move in the first four seconds of motion?
 m

Supporting Materials

[Physical Constants](#)

Assignment Details

Name (AID): Physics Problem Set 7 - Week 8 (5762137)
 Submissions Allowed: 5
 Category: Homework

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 Before due date
 Question Score
 Assignment Score