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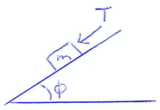
1. (1 point)
Student Name: Arfaz Hossain
Student ID: V00984826

A box of mass $m = 35.4$kg is on a rough tilted surface.
The surface makes an angle $\phi = 22.1^\circ$ with the horizontal.
The coefficient of static friction between the mass and the surface is $\mu = 0.606$.
The mass is being pushed down the slope by a force of magnitude T. This is shown in the diagram.



(The input below will accept answers with no more than 1
What is the largest possible T where the mass can be in static equilibrium?
$T \leq$ _____ N
UVic Problem ID: 59291611324924130
Student Name: Arfaz Hossain
Student ID: V00984826
Correct Answers:

- 64.268

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2. (1 point)
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A box of mass m is on a rough horizontal surface.
The box has a coefficient of static friction with the surface of $\mu = 0.209$. It is pulled to the right by a rope which exerts a force of magnitude $T = 244.5$N at an angle of $\theta = 29.3^\circ$ with the positive x-axis.
This is shown in the diagram.

(The input below will accept answers with no more than 1
What is the smallest value of m consistent with equilibrium?
$m \geq$ _____ kg
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Correct Answers:

- 116.311

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3. (1 point)
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A mass $m = 31.7$kg is supported against gravity by three ropes.
Rope 1 pulls directly to the right (in the positive x-direction) exerting a force of magnitude $T_1 = 39.6$N.
Rope 2 pulls up and to the left with a force magnitude $T_2 = 159.1$N making an angle of $\theta = 19.6^\circ$ with the vertical.
Rope 3 pulls exerting a force of an unknown magnitude and in an unknown direction.
(The input below will accept answers with no more than 1
What is the magnitude of the force exerted by rope 3?
_____ N
What is the angle between the force exerted by rope 3 and the positive x-axis?
_____ degrees
UVic Problem ID: 59291611324924130
Student Name: Arfaz Hossain
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Correct Answers:

- 161.367
- 85.105

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4. (1 point)
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A box of mass $m = 35.4$kg is stationary on a rough horizontal surface.
The box is pulled by two ropes. Rope 1 pulls with a force of magnitude $T_1 = 110.7$N making an angle of $\theta_1 = 17.8^\circ$ with the negative x-axis ($-\hat{i}$). Rope 2 pulls with a force of magnitude $T_2 = 77.8$N making an angle of $\theta_2 = 13.7^\circ$ with the positive x-axis ($\hat{i}$).
The coefficient of static friction between the mass and the surface is $\mu = 0.798$. This is shown in the diagram.

(The input below will accept answers with no more than 1
What is the x-component of the force of friction the surface exerts on the mass?
_____ N
What is the z-component of the normal force the surface exerts on the mass?
_____ N
UVic Problem ID: 0301611324924130
Student Name: Arfaz Hossain
Student ID: V00984826
Correct Answers:

- 29.814
- 294.654

5. (1 point)

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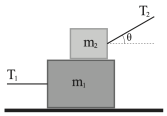
A box of mass $m_1 = 74.7$kg is on a frictionless horizontal surface.

The mass is pulled to the left by a horizontal rope which exerts a force of magnitude T_1.

A box of mass $m_2 = 52.9$kg sits on top of m_1. It is pulled by a force of magnitude $T_2 = 92.5$N that makes an angle of $\theta = 17.8°$ with the horizontal.

The coefficient of static friction the two masses is $\mu = 0.598$. This is shown in the diagram.



(The input below will accept answers with no more than 1

Given that the blocks are in equilibrium, what is T_1?

_____ N

UVic Problem ID: 0301611324924130

Student Name: Arfaz Hossain

Student ID: V00984826

Correct Answers:

- 88.072

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