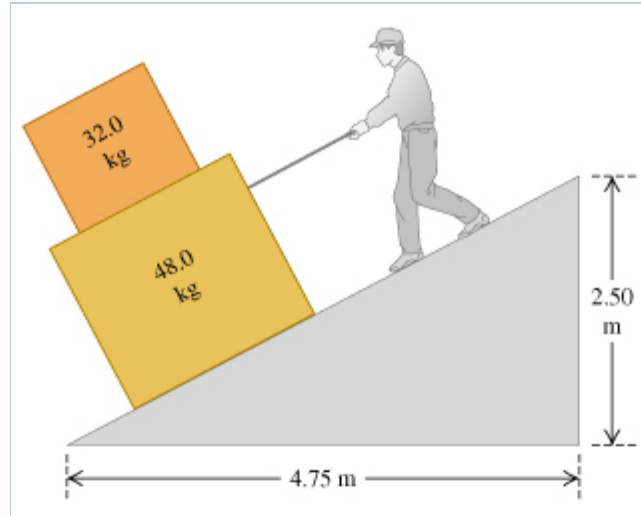
#14 Friction Post-class

Due: 11:00am on Monday, September 24, 2012

Note: You will receive no credit for late submissions. To learn more, read your instructor's [Grading Policy]

Exercise 5.33

You are lowering two boxes, one on top of the other, down the ramp shown in the figure by pulling on a rope parallel to the surface of the ramp. Both boxes move together at a constant speed of 13.0$\mathrm{cm/s}$. The coefficient of kinetic friction between the ramp and the lower box is 0.479, and the coefficient of static friction between the two boxes is 0.790.



Part A

What force do you need to exert to accomplish this?

ANSWER:

T = 32.8 N

Correct

Part B

What is the magnitude of the friction force on the upper box?

ANSWER:

f = 146 N

Correct

Part C

What is the direction of the friction force on the upper box?

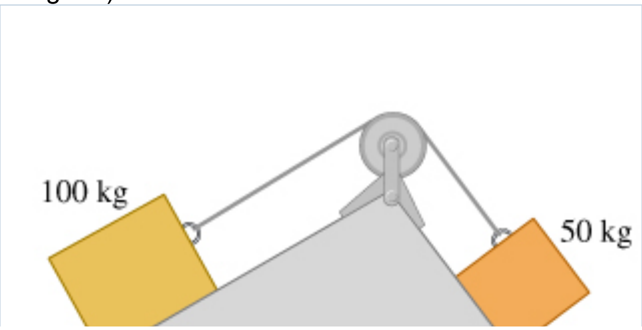
ANSWER:

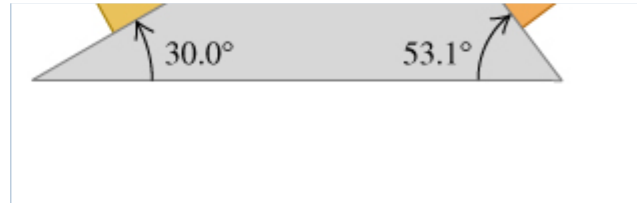
- up the ramp
- down the ramp

Correct

Problem 5.86

Two blocks connected by a cord passing over a small, frictionless pulley rest on frictionless planes (the figure).





Part A

Which way will the system move when the blocks are released from rest?

ANSWER:

- (selected) the blocks will slide to the left
- the blocks will slide to the right

Correct

Part B

What is the acceleration of the blocks?

ANSWER:

a = 0.658 $\mathrm{m/s^2}$

Correct

Part C

What is the tension in the cord?

ANSWER:

T = 424 N

Correct

Exercise 5.30

A box of bananas weighing 40.0 N rests on a horizontal surface. The coefficient of static friction between the box and the surface is 0.40 and the coefficient of kinetic friction is 0.20.

Part A

If no horizontal force is applied to the box and the box is at rest, how large is the friction force exerted on the box?

ANSWER:

0 N

Correct

Part B

What is the magnitude of the friction force if a monkey applies a horizontal force of 6.0 N to the box and the box is initially at rest?

Express your answer using two significant figures.

ANSWER:

6.0 N

Correct

Part C

What minimum horizontal force must the monkey apply to start the box in motion?

Express your answer using two significant figures.

ANSWER:

16 N

Correct

Part D

What minimum horizontal force must the monkey apply to keep the box moving at constant velocity once it has been started?

Express your answer using two significant figures.

ANSWER:

8 N

Correct

Part E

If the monkey applies a horizontal force of 18.0 N, what is the magnitude of the friction force ?

Express your answer using two significant figures.

ANSWER:

8 N

Correct

Part F

If the monkey applies a horizontal force of 18.0 N, what is the box's acceleration?

ANSWER:

2.45 $\mathrm{m/s^2}$

Correct

Score Summary:

Your score on this assignment is 99%.
You received 29.7 out of a possible total of 30 points.