WebAssign
CH04-HW03-SP12 (Homework)

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PHYS 172-SPRING 2012, Spring 2012
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Current Score : 24 / 24 **Due :** Tuesday, January 31 2012 11:59 PM EST

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1. 4/4 points | Previous Answers MI3 4.8.X.008

When you apply a horizontal force of 40 N to a block, the block moves across the floor at a constant speed ($\mu_k = \mu_s$).

(a) What happens if instead you apply a force of 30 N to the blockinitially at rest?

- (•) The block doesn't move.
- ( ) The block decelerates (the speed continually decreases).
- ( ) The block moves at a constant speed, but it moves more slowly.

(b) When you apply a force of 30 N to the block initially at rest, what is the magnitude of the horizontal component of the force that the floor exerts on the block?

F_{hor} = 30 N

(c) What happens if instead you exert a force of 45 N?

- (•) The block accelerates (the speed continually increases).
- ( ) The block doesn't move.
- ( ) The block moves at a constant speed, but it moves faster.

(d) When you apply a force of 45 N, what is the magnitude of the horizontal component of the force that the floor exerts on the block?

F_{hor} = 40 N

- *Read the eBook*
- Section 4.8

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- Section 4.8

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2. 2/2 points | Previous Answers MI3 4.8.X.056

Bob is pushing a box across the floor at a constant speed of 1.3 m/s, applying a horizontal force whose magnitude is 50 N. Alice is pushing an identical box across the floor at a constant speed of 2.6 m/s, applying a horizontal force.

(a) What is the magnitude of the force that Alice is applying to the box?

F = 50 N

(b) With the two boxes starting from rest, explain qualitatively what Alice and Bob did to get their boxes moving at different constant speeds.

- ○ In order to keep the box moving twice as fast, Alice had to apply a constant force that was twice as large as the force that Bob applied.
- ◉ Each initially applied a force bigger than static friction to get the box moving and accelerating, then when the desired final speed was achieved they reduced the force to make the net force zero. ✓

- *Read the eBook*
- Section 4.8

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- Section 4.8

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3. 4/4 points | Previous Answers MI3 4.8.X.058

A 28 kg box sits on a table. The coefficient of static friction μ_s between table and box is 0.27, and the coefficient of kinetic friction μ_k is 0.20.

(a) What is the force required to start the box moving?
F = 74.088 ✓ N

(b) What is the force required to keep it moving at constant speed?
F = 54.88 ✓ N

- *Read the eBook*
- Section 4.8

- *Read the eBook*
- Section 4.8

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4. 7/7 points | Previous Answers MI3 4.8.X.009

A 8 kg box with initial speed 8 m/s slides across the floor and comes to a stop after 1.5 s.

(a) What is the coefficient of kinetic friction?
μ_k = 0.544 ✓

(b) How far does the box move?
distance = 6 ✓ m

(c) You put a 5 kg block in the box, so the total mass is now 13 kg, and you launch this heavier box with an initial speed of 8 m/s. How long does it take to stop?
Δt = 1.5 ✓ s

- *Read the eBook*
- Section 4.8

- *Read the eBook*
- Section 4.8

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5. 7/7 points | Previous Answers MI3 4.8.X.059

A 29 kg box is being pushed across the floor by a constant force < 110, 0, 0 > N. The coefficient of kinetic friction for the table and box is 0.17. At t = 7.0 s the box is at location < 11, 2, −3 > m, traveling with velocity < 6, 0, 0 > m/s. What is its position and velocity at t = 8.3 s?

New velocity $\vec{v}$ = ✔ m/s

New position $\vec{d}$ = ✔ m

- *Read the eBook*
- Section 4.8

- *Read the eBook*
- Section 4.8