

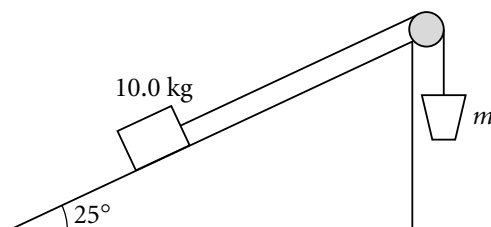
## Section

**4-4**

## HOLT PHYSICS

**Concept Review***Everyday Forces*

A wooden box with a mass of 10.0 kg rests on a ramp that is inclined at an angle of  $25^\circ$  to the horizontal. A rope attached to the box runs parallel to the ramp and then passes over a frictionless pulley. A bucket with a mass of  $m$  hangs from the end of the rope. The coefficient of static friction between the ramp and the box is 0.50. The coefficient of kinetic friction between the ramp and the box is 0.35.



1. Suppose the box remains at rest relative to the ramp. What is the maximum magnitude of the friction force exerted on the box by the ramp?  
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2. Suppose the box slides along the ramp. What is the maximum magnitude of the friction force exerted on the box by the ramp?  
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3. Suppose the bucket has a mass of 2.0 kg.
  - a. What is the friction force exerted on the box by the ramp?  
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  - b. Does the box remain at rest relative to the ramp?  
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4. Suppose water is added to the bucket so that the total mass of the bucket and its contents is 6.0 kg.
  - a. What is the friction force exerted on the box by the ramp?  
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  - b. Does the box remain at rest relative to the ramp?  
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