More Friction Problems

1. An 8 kg wooden block rests on a wooden table. The coefficient of static friction is 0.62. What is the maximum force that can be applied to the block without it moving?

2. A 50.0 N force is applied horizontally to a 200.0 N box causing it to slide across the floor with a constant velocity. What is the coefficient of kinetic friction between the box and the floor?

3. Batman is driving the batmobile at a rate of 50 m/s when he notices a cliff 150 m ahead. He steps on the brakes locking the wheels and begins to skid. The batmobile has a mass of 2500 kg and the coefficient of friction between the car tires and the road is 0.8. Does Batman stop in time?

4. A horizontal force of 60N is applied to a box with a mass of 10kg. The force causes the box to accelerate at a rate of $2m/s^2$. Calculate
   (a) the force of kinetic friction acting on the box?
   (b) the coefficient of kinetic friction between the two surfaces?

5. A block of wood slides along the floor with an initial velocity of 5 m/s. The coefficient of kinetic friction between the floor and the block is 0.3. How far will the block slide until it stops?

6. A 10 kg box is sliding down an incline of 30°. Calculate the coefficient of kinetic friction when the box is sliding down the slope with
   (a) a constant velocity.
   (b) an acceleration of $2.0 m/s^2$.

7. A 4 kg box is placed on an incline with an angle of 30°. The coefficient of static friction between the surfaces is 0.68. Will the box remain at rest?

8. You find yourself pushing a 60 kg box at constant velocity up a ramp of 15°. The coefficient of kinetic friction between the box and the ramp is 0.25. Calculate how much force you are exerting on the box.

Numerical Answers:

1.	48.61 N		5.	4.25 m	
2.	0.25		6.	(a)	0.58
3.	no			(b)	0.34
4.	(a)	40 N	7.	yes	
	(b)	0.41	8.	294.18 N	

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