

Friction

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1. A 20kg box is pushed forward with a force of 250N. The coefficient of friction between the box and the ground is $\mu=0.2$.

- a) What is the force of friction?
- b) Find the acceleration of the block?

2. A 300kg box at rest is pushed with a force 2000N.

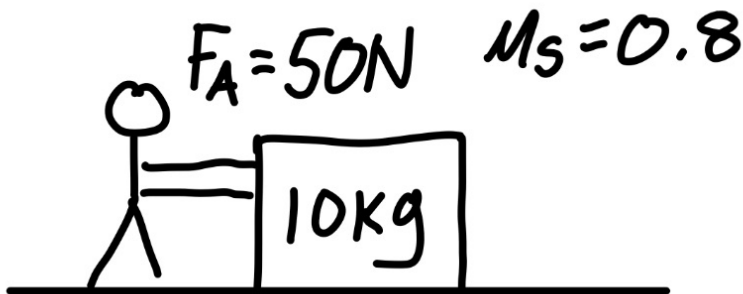
- a) If $\mu_s=0.6$, will the block move?
- b) If the block did move in a) and $\mu_k=0.3$, what will the acceleration of the box be?

3. A 6.0kg box is pulled along the ground where $\mu_s=0.3$, $\mu_k=0.2$. What force is needed to accelerate it at 0.68m/s^2 ?

4. A 15kg box is sliding on a frictionless surface with velocity of 3m/s. It then encounters a surface with a coefficient of friction of $\mu_k=0.3$.

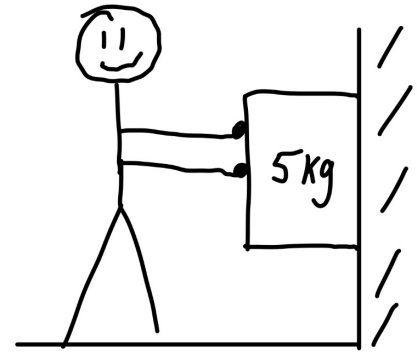
- a) Calculate the force of friction
- b) Find the acceleration of the box
- c) How far will the box travel on the new surface? (use kinematics)

5. A 10kg box at rest is pushed with a force of 50N. If $\mu_s=0.8$, what is the force of friction? Think about your answer. Does your answer make sense?



6. A 5kg box is pushed on a wall and stays in place.

- a) Why is the book not falling to the ground?
- b) Draw a free body diagram and label each force.
- c) If $\mu_s=0.3$, determine the minimum force the student needs to push to keep the book from not moving.



7. A 10kg box is pushed with a force of 200N on a wall and is not moving. Calculate the coefficient of friction.

8. Bob pulls a 43kg box to the left by a 265N force. You decide to pull the box with a force of 400N to the right. If $\mu_k=0.2$,

- a) Calculate the acceleration.
- b) Serah enters and decides to pull the box left with a force of 300N to the left. Calculate the acceleration now.