

Oct 23-8:06 AM

A boy pushes a 10kg box to the right at a constant velocity. The coefficient of kinetic friction is 0.25. What is the frictional force?

means  $a=0$  means  $F_{net} = 0$

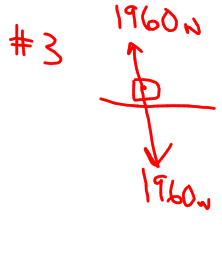
$F_f = F_n \mu_k = 98N(0.25)$

$= 24.5N$

Oct 23-8:36 AM

A worker pushes a 200kg pallet of bananas to the right at a constant velocity. The coefficient friction between the floor and the pallet is 0.20.

1. what is the direction of the frictional force? *Left*
2. What is the weight of the pallet?  $w = mg = (200\text{kg})(9.8) = 1960\text{N}$
3. What is the normal force acting on the pallet?  $1960\text{N}$
4. What is the frictional force acting on the pallet of bananas?  $392\text{N}$
5. What is the acceleration of the pallet?  $0\text{ m/s}^2$
6. What is the net force acting on the pallet?  $0\text{N}$
7. How much force is the worker pushing?  $392\text{N}$

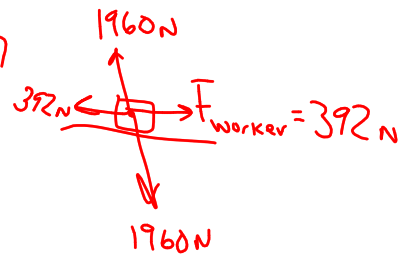


#4

$$F_f = F_n \mu$$

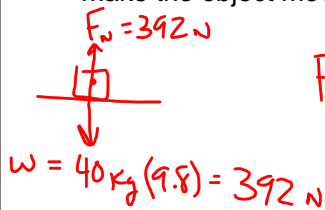
$$F_f = 1960\text{N}(.20)$$

$$= \underline{\underline{392\text{N}}}$$



Oct 23-12:00 PM

A 40kg cabinet needs to be moved. How hard must a person push in order to make the object move? (coefficient of static friction = 0.40)



$$F_f = F_n \mu$$

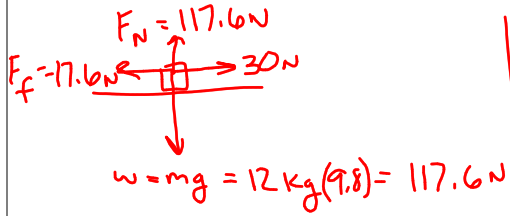
$$F_f = 392\text{N}(.40)$$

$$\boxed{F_f = 156.8\text{N}}$$

For Static friction this is the max amount friction can push.

Oct 23-10:17 AM

A girl pushes a 12kg crate with a force of 30N. What is the acceleration of the crate if the coefficient of friction between the crate and floor is 0.15?



$$F_f = F_N \mu$$

$$F_f = (117.6\text{N})(.15) = 17.6\text{N}$$

$$F_{\text{net}} = 30\text{N} + (-17.6\text{N})$$

$$F_{\text{net}} = 12.4\text{N}$$

$$F_{\text{net}} = ma$$

$$12.4\text{N} = 12\text{kg}(a)$$

$$a = 1.03\text{m/s}^2$$

Oct 23-10:18 AM

A 10kg crate is being pushed with a force of 20N. The crate is moving at a constant 2.0m/s. What is the coefficient of friction between the floor and the crate?

$$\mu = ?$$

$$F_N = 98\text{N}$$

$$F_f = 20\text{N}$$

$$F_f = F_N \mu$$

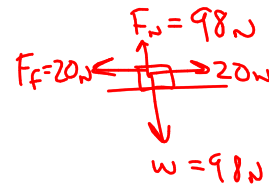
$$20\text{N} = 98\text{N}(\mu)$$

$$\frac{20\text{N}}{98\text{N}} = \mu$$

$$\mu = 0.20$$

$$w = mg$$

$$w = 10\text{kg}(9.8) = 98\text{N}$$



Oct 24-7:55 AM

A girl is pushing a 15kg desk. She must push 40N in order for the desk to move. What is the coefficient of friction between the desk and floor?

$$F_f = F_n \mu$$

$$40\text{N} = 147\text{N} \mu$$

$$\frac{40\text{N}}{147\text{N}} = \mu$$

$$\mu = .27$$

$F_n = 147\text{N}$   
 $F_f = 40\text{N}$

$F_n = 147\text{N}$   
 $40\text{N} = 147\text{N} \mu$

$w = mg = 15\text{kg}(9.8) = 147\text{N}$

Oct 24-7:57 AM

### Static Friction Lab

Goal: find the coefficient of static friction between wood + metal

$\mu_s = ?$

$$F_f = F_n \mu_s$$

$F_n =$  find the mass of the wood. convert to kg then multiply by  $9.8\text{m/s}^2$ .

$F_f =$  Add weights to your string until it starts to move (find the minimal amount of mass required to make the wood move) convert that mass to "kg" then  $\times 9.8\text{m/s}^2$

Oct 24-1:02 PM

## Kinetic Friction Lab

Goal: find the coefficient of  
Kinetic friction!  $\mu_k$

$\mu_k = ?$

$$F_f = F_N \mu_k$$

Same  $F_N$  as last lab (if you're using  
Same wood)

$F_f \rightarrow$  add the correct amount of  
weight so that the wood will keep  
moving once you give it a tap

Oct 24-1:48 PM

Oct 25-10:35 AM