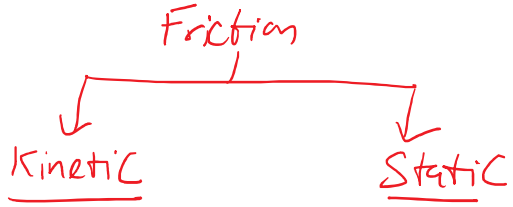
Friction

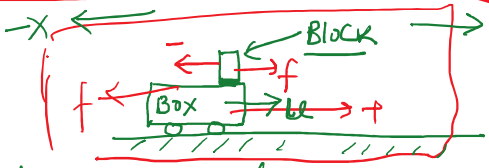
Tuesday, February 16, 2021 2:58 PM



(1) Kinetic friction: When two bodies in contact move with respect to each other, rubbing the surface in contact, the friction between them is called kinetic friction.

(1) for A it will be $-x$
(2) for B it will be $+x$

friction always oppose the motion



(1) Find the direction of friction

(1) – friction on box because of block ⇒ $-x$
(2) – friction on block beacuse of box ⇒ $+x$

$ Magnitude :— The magnitude of kinetic friction is proportional to the normal force acting between two bodies.

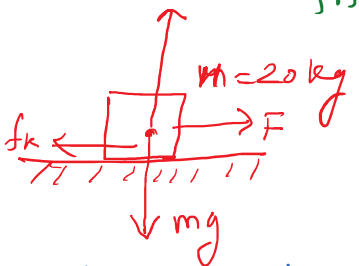
$f \propto N$

$\Rightarrow \boxed{f = \mu_k N}$

μ_k = Coefficient of kinetic friction

N.1

$m = 20\ kg$
$\mu_k = 0.25$
$g = 9.8\ m/s^2$



$f_k =$

$\boxed{f = \mu_k N}$

(1) Kinetic friction does not depend on the speed.

Covering small area compared to the second one

(2) friction does not depend on the area also

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(2) Static friction: Frictional force if the bodies are in contact but not sliding with respect to each other.

Example: Pushing an heavy Almira –

$= \mu_s N \Rightarrow \mu_s$ = Coefficient of static friction

$f = \mu_k N$

N = Normal force

N4: $m = 30\,kg$, $\theta = 10^\circ$ and $F = 85\,N$

Calculate the friction coefficient if the cart is pushed at a constant speed.

$F = F_f + mg\sin\theta$

$F = \mu_k F_N + mg\sin\theta$

$F = \mu_k mg\cos\theta + mg\sin\theta$

$\Rightarrow \mu_k = \dfrac{F_a - mg\sin\theta}{mg\cos\theta}$

$F_a = 85^\circ$ N

$\mu_k = 0.117$