Date: 24/08/2022

Subject: Physics | Class: Standard XI

Topic : Friction | Time: 00:20 hrs

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1. A cubical block rests on a plane of $\mu = \sqrt{3}$. The angle through which the plane be inclined to the horizontal so that the block just slides down will be

   A. 30°

   B. 45°

   C. 60°

   D. 75°

2. A body of mass $2\ \text{kg}$ is kept on a rough horizontal surface. If $\mu_s = 0.5$ and an external force of $F = 5\ \text{N}$ is applied on the body, find the angle of friction. (Take $g = 10\ \text{m/s}^2$)

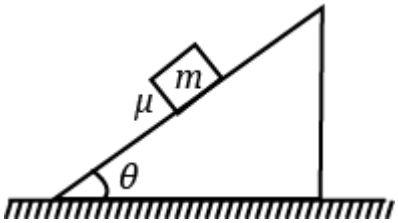
   A. $\tan^{-1}\left(\frac{1}{2}\right)$

   B. $\tan^{-1}(2)$

   C. $\cot^{-1}(2)$

   D. $\cot^{-1}\left(\frac{1}{2}\right)$

3. A body is placed on an inclined plane. The coefficient of friction between the body and the plane is μ. The plane is gradually tilted up. If θ is the inclination of the plane, then frictional force on the body is



A. constant upto $\theta = \tan^{-1}(\mu)$ and decrease after that

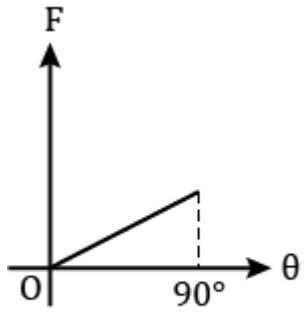
B. increases upto $\theta = \tan^{-1}(\mu)$and decrease after that

C. decreases upto $\theta = \tan^{-1}(\mu)$ and constant after that

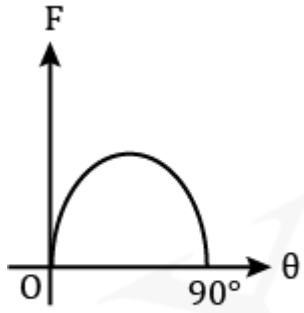
D. Increases upto $\theta = \tan^{-1}(\mu)$ and constant after that

4. A block rests on a rough plane whose inclination θ to the horizontal can be varied. Which of the following graphs indicates how the frictional force F between the block and the plane varies as θ is increased?

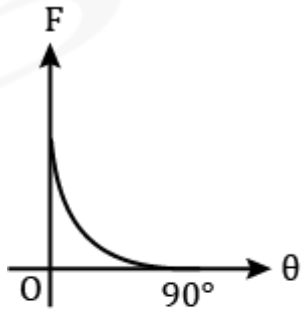
A.



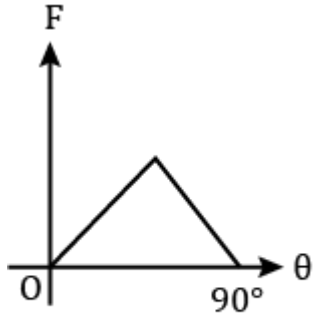
B.



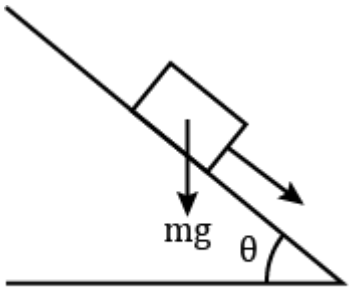
C.



D.



5. A plank with a box on it at one end is gradually raised about the other end. As the angle of inclination with the horizontal reaches 30°, the box starts to slip and slides $4.0\ \mathrm{m}$ down the plank in $4.0\ \mathrm{s}$. The coeffficient of static and kinetic friction between the box and the plank will respectively be



A. 0.4 and 0.3

B. 0.6 and 0.6

C. 0.6 and 0.5

D. 0.5 and 0.6