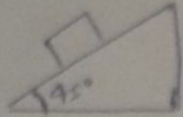


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- 5.35** When a body slides down from rest along a smooth inclined plane making an angle of 45° with the horizontal, it takes time T . When the same body slides down from rest along a rough inclined plane making the same angle and through the same distance, it is seen to take time pT , where p is some number greater than 1. Calculate the co-efficient of friction between the body and the rough plane.

⇒



(a) NO friction ⇒

$$u=0, s=S, t=T, a = g \sin 45^\circ = \frac{g}{\sqrt{2}}$$

$$S = ut + \frac{1}{2}at^2$$

$$S = \frac{gT^2}{2\sqrt{2}}$$

(b) Friction

$$u=0, s = \frac{gT^2}{2\sqrt{2}}, a = g \sin 45^\circ - \frac{f}{m}, t = PT$$

→ 10N

$$a = mg \left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} \right)$$

$$s = ut + \frac{1}{2}at^2$$

By substituting we get ⇒

$$ll = \left(1 - \frac{1}{p^2} \right)$$