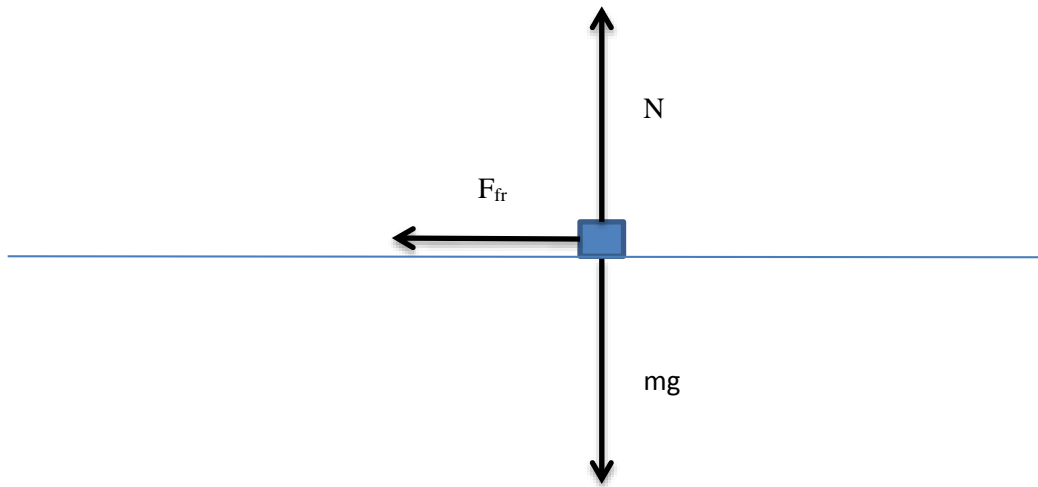


Answer on Question #45829, Physics, Mechanics | Kinematics | Dynamics

Question:

An 800 kg car moving at 30 m/s brakes and skids to a stop over surface with coefficient of friction 0.60 make diagram and find force of friction and distance to stop

Answer:



Newton's second law of motion:

$$ma = F_{fr}$$

Newton's first law of motion:

$$N = mg$$

Friction force equals

$$F_{fr} = \mu N = \mu mg = 0.6 \cdot 9.8 \cdot 800 = 4700 \text{ N}$$

where μ - coefficient of friction.

Therefore:

$$a = \frac{\mu mg}{m} = \mu g$$

distance to stop equals:

$$d = \frac{v^2}{2a} = \frac{v^2}{2\mu g} = \frac{30^2}{2 \cdot 0.8 \cdot 9.8} = 77 \text{ m}$$