

PHY101 Assignment 1 Solution Fall 2021

Question NO 1

Solution

Given data in this Question

Mass of the car is $= 2.0 \times 10^3 \text{ kg}$

velocity of the card is $= u = 45 \text{ m/s}$

final velocity $= v = 0$

Friction force is $= 7.5 \times 10^3 \text{ kg}$

Requirement NO 1

Solution

Determine the least distance $= s = d$?

we need acceleration now

$$F_{fr} = \mu_k N = \mu_k mg$$

friction force = Normal force in opposite direction

$$F_n = -F_{fr}$$
$$mg = -\mu_k mg$$

$$a = -\mu_k g$$

$$(g = 9.8 \text{ and } \mu_k = 7.5 \times 10^{-3})$$

$$a = -7.5$$

$$10^{-3} \times 9.8 \text{ } a = -$$

$$73.5 \times 10^{-3} \text{ Newton}$$

$$\text{3rd Law } v^2 = u^2$$

$$+ 2as$$

by using eq(1) value find out and putting value

$$0 = (45)^2 + 2(-73.5$$

$$10^{-3})s \quad 2(-73.5 \times 10^{-3})s =$$

$$(45)^2$$

$$S = 0.0137 \text{ m}$$

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Requirement NO 2

Solution

$$\begin{aligned} &= u = \quad \quad \quad^{-1} \\ &V \quad 40ms \\ &2 \\ &\text{Newton 3rd Law} \\ &2 = \quad 2 \\ &v \quad u \quad + 2as \\ &2 \quad \quad 2 + \\ &v = (40) \quad (-2013.6) \\ &v^2 = 1600 - 20113.9 \\ &V = 20.34 \text{ m/s} \end{aligned}$$

Requirement NO 3

Solution

The given end results that law of newton's play key role in our lifestyles and whilst we appearance deep this scenario in line with physics then we can also see the importance in daily lifestyles. The scenario specifically focuses on newton's regulation of movement. Moreover, also on the following examples;

1. Pushing a vehicle and a truck
2. Pushing a shopping cart
3. Two humans walking collectively
4. Hitting a ball
5. Rocket release
6. Vehicle crash
7. Object thrown from a height
8. Karate participant breaking slab of bricks

Question NO 2

Solution

$$V_i = V \text{ mph} \quad \text{mph} = (\text{mile per hour})$$

Convert mile per hour

$$V_i = 0.44704 \text{ m/s}$$

$$s = d \text{ feet}$$

Convert feet into meters

$$s = 0.30480$$

$$v_f^2 = v_i^2 + 2as$$

$$(0)^2 = (0.44704)^2 + 2a(0.30480)$$

$$0 = 0.1998 + 2(0.30480)(a)$$

$$a = \frac{-0.1998}{2(0.30480)}$$

$$a = -0.3278$$

velocity is $2v$ then

find the skid

$$\text{distance } v_f^2 - v_i^2 =$$

$$2as$$

$$0 - (2)^2 = 2(-0.3278)s$$

$$\frac{-4}{2(-0.3278)} = s$$

$$s = 6.101$$