

QUIZ 3

Name..... Roll no. .... Date .....

Semester ..... Class ..... Section.....

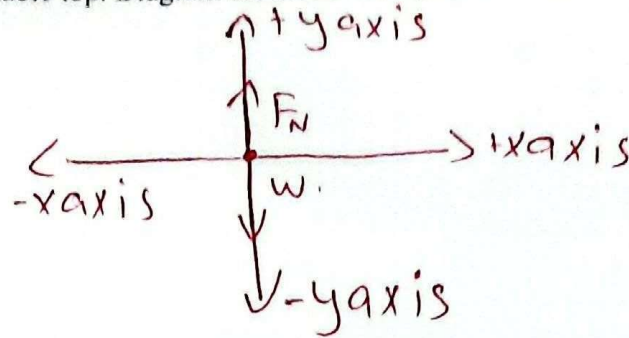
Instructions:

- ✦ Attempt all questions.
- ✦ Show all steps clearly.
- ✦ Direct answers without steps will result in mark deductions.

Q1. A book is at rest on a table top. Diagram the forces acting on the book.

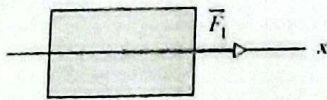
[2 Marks]

Sol:



Q2. There are two horizontal forces on the 2.0 kg box in the overhead view of Fig. but only one (of magnitude  $F_1 = 20$  N) is shown. The box moves along the x axis. For each of the following values for the acceleration ax of the box, find the second force in unit-vector notation: (a)  $-10$  m/s<sup>2</sup>, (b)  $-20$  m/s<sup>2</sup>, (c) 0.

[8 Marks]



Sol:

$$m = 2.0 \text{ kg} \quad (b): \sum F = 20 + F_2 x$$

$$F_{1x} = 20 \text{ N}$$

$$F_{1y} = 0$$

$$\sum F_y = F_{1y} + F_{2y}$$

$$0 = 0 + F_{2y}$$

$$0 = F_{2y}$$

$$ma = 20 + F_2 x$$

$$(2)(-20) = 20 + F_2 x$$

$$-40 - 20 = F_2 x$$

$$-60 = F_2 x$$

$$(c) \text{ Sol: } \sum F = 20 + F_2 x$$

$$ma = 20 + F_2 x$$

$$m(0) = 20 + F_2 x$$

$$-20 \hat{i} \text{ N} = F_2 x$$

(a)

$$\text{Sol: } \sum F = \sum F_x$$

$$\sum F = F_{1x} + F_{2x}$$

$$ma = 20 + F_{2x} \Rightarrow 2(-10) = 20 + F_{2x} \Rightarrow -40 \hat{i}$$