Engineering Physics I Name _____
PHYS 1210 Spring 2015

Discussion 3 – Forces

Equations

$$\sum \vec{F} = m\vec{a}$$

$$F_g = mg$$

My Problem Solving Approach (for Forces)

1. Draw a picture
    a. Sketch the whole thing
    b. FBD – each object separate with only its forces on it
    c. Draw expected acceleration on the side in a different color
    d. Draw xy-axes aligned with the acceleration, on the side in a third color
2. "F=ma"
    a. List all the forces on object 1 in the x-direction and its acceleration
    b. Separately repeat for object 1 in the y-direction
    c. Object 2 in x-direction
    d. Object 2 in y-direction
    e. Apply Newton's Law of Forces
3. Do Math
4. Sanity Check

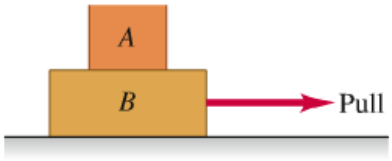
Problems

Young & Freedman, 13e

4.19 • At the surface of Jupiter's moon Io, the acceleration due to gravity is $g = 1.81\ \text{m/s}^2$. A watermelon weighs 44.0 N at the surface of the earth. (a) What is the watermelon's mass on the earth's surface? (b) What are its mass and weight on the surface of Io?

4.28 •• A person pulls horizontally on block B in Fig. E4.28, causing both blocks to move together as a unit. While this system is moving, make a carefully labeled free-body diagram of block A if (a) the table is frictionless and (b) there is friction between block B and the table and the pull is equal to the friction force on block B due to the table.

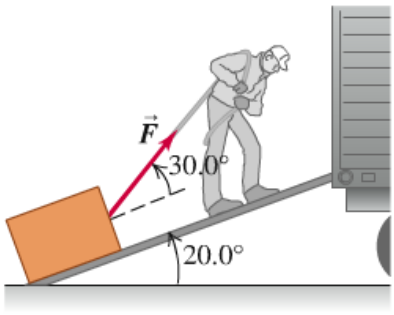
Figure **E4.28**



Horizontal table

4.4 • A man is dragging a trunk up the loading ramp of a mover's truck. The ramp has a slope angle of 20.0°, and the man pulls upward with a force $\vec{F}$ whose direction makes an angle of 30.0° with the ramp (Fig. E4.4). (a) How large a force $\vec{F}$ is necessary for the component F_x parallel to the ramp to be 60.0 N? (b) How large will the component F_y perpendicular to the ramp then be?

Figure **E4.4**



c) Assuming no friction and a trunk mass of 24.5 kg, what is the acceleration of the trunk?