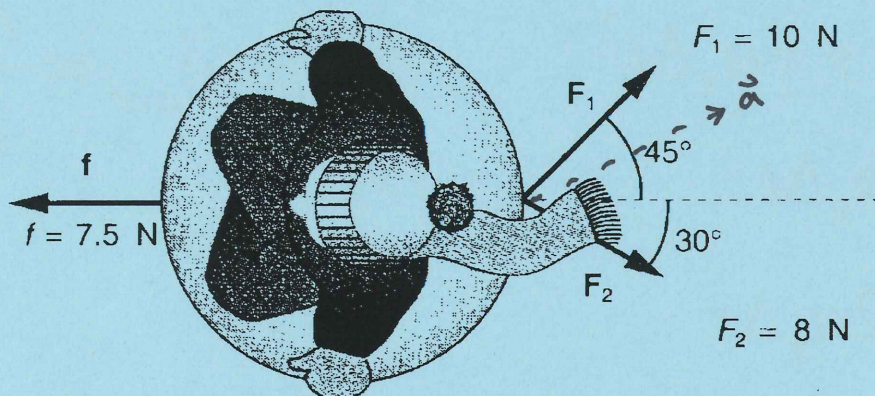


Quiz 4

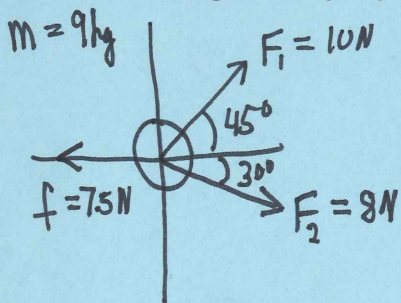
PHYS 1111  
Introductory Physics I  
Quiz 4

Name Charles Johnson

Show all work in the spaces provided



- 1) Two children pull a snow saucer exerting forces as shown above. Find the acceleration of the 9.00 kg sled? (10 points)



$$\sum F_x = ma_x$$

$$F_1 \cos(45^\circ) + F_2 \cos(30^\circ) - f = ma_x$$

$$a_x = \frac{F_1 \cos(45^\circ) + F_2 \cos(30^\circ) - f}{m}$$

$$a_x = \frac{(10\text{ N}) \cos(45^\circ) + (8\text{ N}) \cos(30^\circ) - 7.5\text{ N}}{9\text{ kg}}$$

$$|\vec{a}| = .798 \text{ m/s}^2$$

$$\theta = 25.28^\circ \approx 25^\circ$$

$$\boxed{a_x = .722 \text{ m/s}^2}$$

$$\sum F_y = ma_y$$

$$F_1 \sin(45^\circ) - F_2 \sin(30^\circ) = ma_y$$

$$a_y = \frac{F_1 \sin(45^\circ) - F_2 \sin(30^\circ)}{m}$$

$$a_y = \frac{(10\text{ N}) \sin(45^\circ) - (8\text{ N}) \sin(30^\circ)}{9\text{ kg}}$$

$$\boxed{a_y = .341 \text{ m/s}^2}$$

Quiz 4

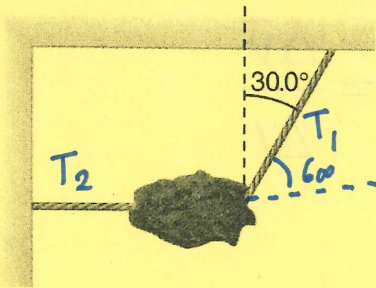
PHYS 2211

Principles of Physics I

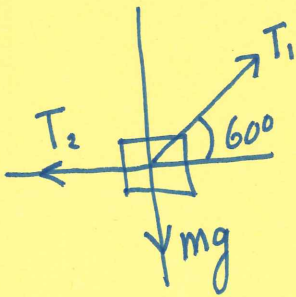
Quiz 4

Name Charles Johnson

For full credit: Show all your work and draw and label a neat Free Body Diagram(s).



- 1) A 200 kg meteorite is suspended in a science museum by two cables as shown. Determine the magnitude of the forces the cables exert on the meteorite.



$$\sum F_x = 0$$

$$T_1 \cos(60^\circ) - T_2 = 0$$

$$T_2 = T_1 \cos(60^\circ)$$

$$T_2 = (2263.21 \text{ N}) \cos(60^\circ)$$

$$T_2 = 1131.61 \text{ N}_{||}$$

$$\sum F_y = 0$$

$$T_1 \sin(60^\circ) - mg = 0$$

$$T_1 = \frac{mg}{\sin(60^\circ)}$$

$$T_1 = \frac{(200 \text{ kg})(9.8 \text{ m/s}^2)}{\sin(60^\circ)}$$

$$T_1 = 2263.21 \text{ N}$$