

Accel motion Sheet #8

A person pulls with 200.0 N on a 50.0 kg box through a rope that makes an angle of 30 degrees with the horizontal. If $\mu = 0.20$ what is the accel rate?

$F = 200 \text{ N}$
 $F_x = 200 \cos 30 = 173.2$
 $F_y = 200 \sin 30 = 100 \text{ N}$
 $F_g = (50)(9.81) = 490.5 \text{ N}$
 $f = \mu N = 0.2(200.5) = 40.1$ (Note: handwritten as 78.1, likely a typo for 40.1)

x DIR

$$F_n = F_x - f$$

$$= 173.2 - 40.1$$

$$= 133.1 \text{ N}$$

y DIR

$$N + F_y = F_g$$

$$N = F_g - F_y$$

$$N = 490.5 - 100$$

$$N = 390.5 \text{ N}$$

$$a = \frac{F_n}{m} = \frac{133.1}{50} = 2.66 \text{ m/s}^2$$

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