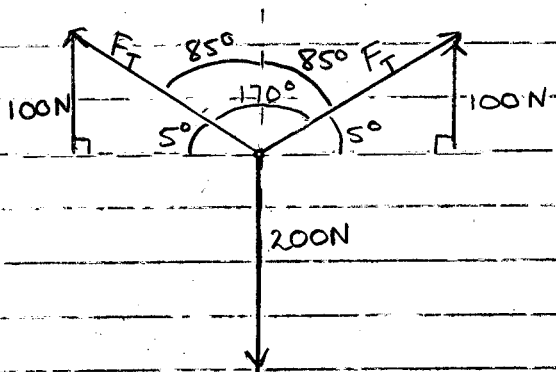


Pretest 2: Solutions

1.



Object @ rest $\Rightarrow F_R = 0$

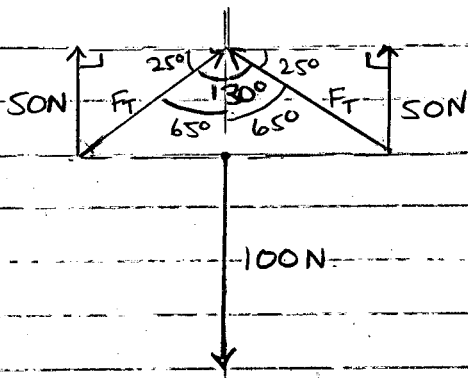
$\Rightarrow F_{right} = -F_{left}$

$\Rightarrow F_{up} = F_{down}$

$$\sin 5^\circ = \frac{100N}{F_T}$$

$$F_T = \frac{100N}{\sin 5^\circ} = 1147.18 \text{ N}$$

2.



Object @ rest $\Rightarrow F_R = 0$

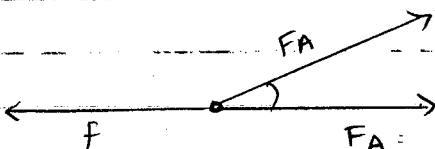
$\Rightarrow F_{right} = -F_{left}$

$\Rightarrow F_{up} = F_{down}$

$$\sin 25^\circ = \frac{50N}{F_T}$$

$$F_T = \frac{50N}{\sin 25^\circ} = 118.18 \text{ N}$$

3.



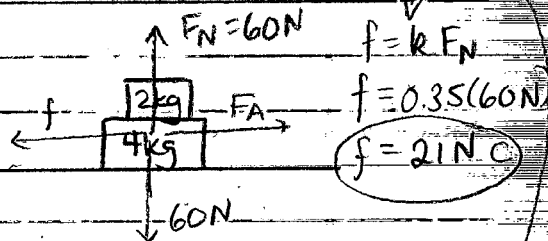
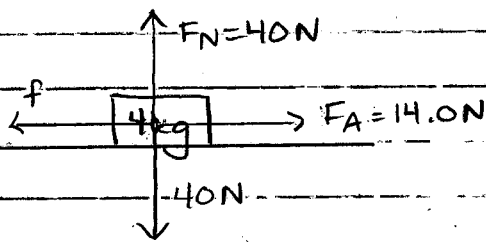
object moving @ constant

velocity $\Rightarrow F_R = 0$

$\Rightarrow f = F_A$

$$f = F_A = 150N \cos 40^\circ = 115.18 \text{ N}$$

4.



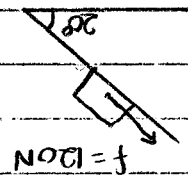
$$f = k F_N$$

$$f = 0.35(60N)$$

$$f = 21.0 \text{ N}$$

@ constant velocity $F_A = f = k F_N = 14.0N \Rightarrow k = \frac{14.0N}{40N} = 0.35$

5.



$$f = W \sin A = 120N$$

$$m g \sin 20^\circ = 120N$$

$$m = 120N$$

$$\frac{10 \frac{m}{s^2} \sin 20^\circ}{}$$

$$m = 35 \text{ kg}$$

D

6.

$$f = W \sin A = m g \sin A$$

$$34N = 10 \text{ kg} (10 \frac{m}{s^2}) \sin A$$

$$\sin A = \frac{34N}{10 \text{ kg} (10 \frac{m}{s^2})}$$

$$A = \sin^{-1}(0.34)$$

$$A = 19.87^\circ \Rightarrow 20^\circ \text{ B}$$

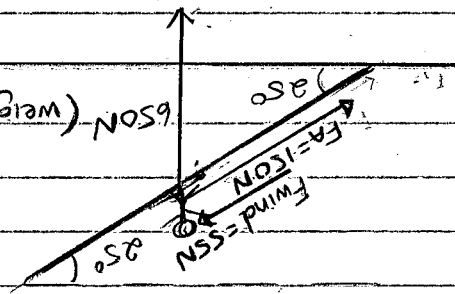
7.

$$f = W \sin A = m g \sin A$$

$$= 6 (10 \frac{m}{s^2}) (\sin 25^\circ)$$

$$f = 25N \text{ A}$$

8.



* for constant velocity $\Rightarrow F_r = 0$
 so relative to incline plane
 $F_A = F_{\text{wind}} + f$
 $150N = 55N + f$
 $f = 95N$
 $R = \frac{F_N}{F_N} = \frac{589N}{95N}$
 $R = 0.16$

$$F_N = W \cos A = 650N \cos 25^\circ = 589N$$