

$$1 \quad F \cos 40^\circ = 10 \text{ kg wt}$$

$$F = \frac{10}{\cos 40^\circ}$$

$$\approx 13.05 \text{ kg wt}$$

$$2 \quad \text{Resolve in the direction of } F.$$

$$F - 10 \cos 55^\circ = 0$$

$$F = 5.74 \text{ kg wt}$$

$$3 \quad \text{First resolve vertically to find } N.$$

$$N \cos 25^\circ - 8 = 0$$

$$N = \frac{8}{\cos 25^\circ}$$

$$\approx 8.83 \text{ kg wt}$$

Keep the exact value of N in your calculator.

Resolve horizontally.

$$F - N \sin 25^\circ = 0$$

$$F = N \sin 25^\circ$$

$$\approx 3.73 \text{ kg wt}$$

$$F - N \sin 25^\circ = 0$$

$$F = N \sin 25^\circ \approx 3.73 \text{ kg wt}$$

$$4 \quad \text{Resolve parallel to the plane, i.e. perpendicular to } N.$$

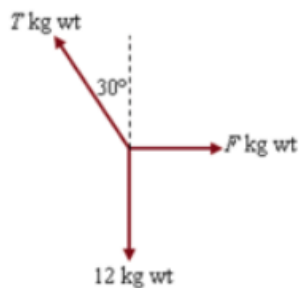
F is at an angle of 34° to the plane.

$$F \cos 34^\circ - 10 \sin 20^\circ = 0$$

$$F = \frac{10 \sin 20^\circ}{\cos 34^\circ}$$

$$\approx 4.13 \text{ kg wt}$$

5



Resolve vertically:

$$T \cos 30^\circ - 12 = 0$$

$$T = \frac{12}{\cos 30^\circ}$$

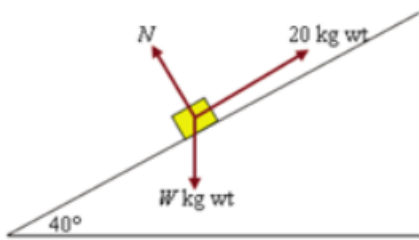
Resolve horizontally:

$$F - T \sin 30^\circ = 0$$

$$F = T \sin 30^\circ$$

$$= \frac{12 \sin 30^\circ}{\cos 30^\circ}$$

$$\approx 6.93 \text{ kg wt}$$



Resolve parallel to the plane.

$$20 - W \sin 40^\circ = 0$$

$$W = \frac{20}{\sin 40^\circ}$$

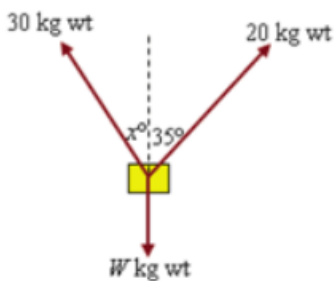
$$\approx 31.11 \text{ kg wt}$$

The force W exerts on the plane is the part of its weight resolved perpendicular to the plane.

$$F = W \cos 40^\circ$$

$$= \frac{20 \cos 40^\circ}{\sin 40^\circ}$$

$$= 23.84 \text{ kg wt}$$



First resolve horizontally so only one unknown is involved.

$$30 \sin x - 20 \sin 35^\circ = 0$$

$$\sin x = \frac{20 \sin 35^\circ}{30}$$

$$= 0.382$$

$$x \approx 22^\circ 29'$$

Keep the exact value in your calculator and resolve vertically.

$$0 = W - 20 \cos 35^\circ - 30 \cos 22.481^\circ$$

$$W = 20 \cos 35^\circ + 30 \cos 22.481^\circ$$

$$\approx 44.10 \text{ kg wt}$$

8 Pressure of body on plane

$$= 10 \cos 50^\circ$$

$$\approx 6.43 \text{ kg wt}$$

Resolve parallel to the plane.

$$T - 10 \sin 50^\circ = 0$$

$$T = 10 \sin 50^\circ$$

$$\approx 7.66 \text{ kg wt}$$

Resolve parallel to the second plane.

$$T - W \sin 40^\circ = 0$$

$$W = \frac{T}{\sin 40^\circ}$$

$$= \frac{10 \sin 50^\circ}{\sin 40^\circ}$$

$$\approx 11.92 \text{ kg wt}$$

9 First find the angle between the string and the vertical.

$$\sin x = \frac{9}{15 + 9}$$

$$= 0.375$$

$$x = 22.024^\circ$$

Resolve vertically.

$$T \cos x - 3 = 0$$

$$T = \frac{3}{\cos 22.024^\circ}$$

$$\approx 3.24 \text{ kg wt}$$