

## Answer on Question #54893, Physics / Mechanics | Kinematics | Dynamics

On her way to visit grandmother, Red Riding Hood sat down to rest and placed her 1.2-kg basket of goodies beside her. A wolf came along, spotted the basket, and began to pull on the handle with a force of 6.4 N at an angle of 25 degrees with respect to vertical. Red was not going to let go easily, so she pulled on the handle with a force of 12 N. If the net force on the basket is straight up, at what angle was Red Riding Hood pulling?

### Solution:

If net force is straight up, then the x components of both forces must cancel each out.

Let  $R$  be the net force applied by Red Riding Hood, and  $W$  be the net force applied by the wolf such that

$$R \sin \theta = W \sin \varphi$$

where

$$W = 6.4 \text{ N}$$

$$\varphi = 25^\circ \text{ with vertical}$$

$$R = 12 \text{ N}$$

Thus,

$$\sin \theta = \frac{W \sin \varphi}{R} = \frac{6.4 \cdot \sin 25^\circ}{12} = 0.2254$$

$$\theta = \sin^{-1} 0.2254 = 13.03^\circ \text{ with vertical}$$

**Answer:**  $13.03^\circ$  with vertical