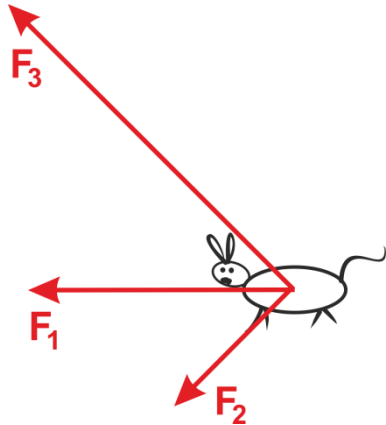


### Answer on Question #73840 Physics / Other

Three people pull simultaneously on a stubborn donkey. Jack pulls directly ahead of the donkey with a force of  $F_1 = 98.5$  N, Jill pulls with  $F_2 = 69.3$  N in a direction  $45^\circ$  to the left, and Jane pulls in a direction  $45^\circ$  to the right with  $F_3 = 125$  N. (Since the donkey is involved with such uncoordinated people, who can blame it for being stubborn?) Find the magnitude of the net force the people exert on the donkey.

**Solution:**



The net force

$$\mathbf{F} = \mathbf{F}_1 + \mathbf{F}_2 + \mathbf{F}_3$$

The components of the net force

$$F_x = F_1 + F_2 \cos 45^\circ + F_3 \cos 45^\circ$$

$$F_y = -F_2 \sin 45^\circ + F_3 \sin 45^\circ$$

$$F_x = 98.5 + 69.3 \times \frac{\sqrt{2}}{2} + 125 \times \frac{\sqrt{2}}{2} = 235.9 \text{ N}$$

$$F_y = -69.3 \times \frac{\sqrt{2}}{2} + 125 \times \frac{\sqrt{2}}{2} = 39.4 \text{ N}$$

The magnitude of the net force

$$F = \sqrt{F_x^2 + F_y^2} = \sqrt{235.9^2 + 39.4^2} = 239 \text{ N}$$

**Answer:** 239 N