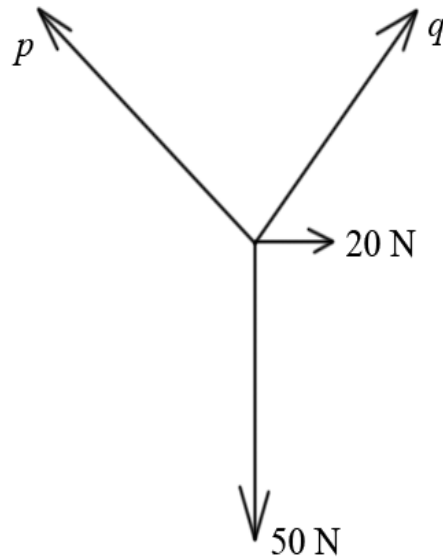Question #77506, Physics / Classical Mechanics

2 forces, p & q, act NW & NE respectively. They are in equilibrium with a force of 50N acting due S & a force 20N acting due E. Find p & q

Solution

(diagram is not to scale)

Since the forces are in equilibrium, setting up the equations.

$$\begin{cases} \sum F_x = 0 \\ \sum F_y = 0 \end{cases};$$

$$\begin{cases} -p\cos 45° + q\cos 45° + 20 = 0 \\ p\cos 45° + q\cos 45° - 50 = 0 \end{cases}$$

Solving the system for *p* and *q*, obtaining

p = 49.5 N; *q* = 21.2 N