

PHYSICS 534

EXERCISE-13

Resultant Forces



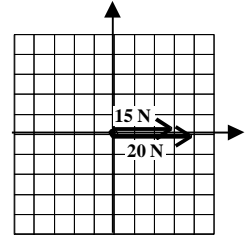
Carl Braun was awarded the Nobel prize for physics in 1909 for his work on wireless telegraphy.

BRAUN

1. Mathematically, find the resultant force for each of the following concurrent forces and sketch each case. Round off your answers to the nearest whole number.

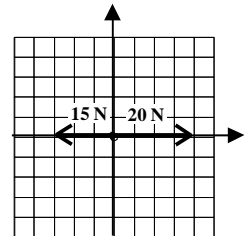
- a) 20 N East and 15 N East

$$20 \text{ N East} + 15 \text{ N East} = 35 \text{ N East}$$



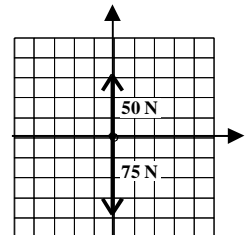
- b) 20 N East and 15 N West

$$20 \text{ N East} + 15 \text{ N West} = 5 \text{ N East}$$



- c) 50 N North and 75 N South

$$75 \text{ N South} + 50 \text{ N North} = 25 \text{ N South}$$

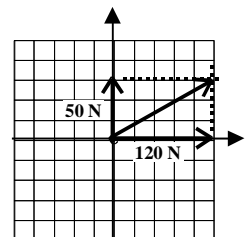


- d) 50 N North and 120 N East

$$\therefore F_R^2 = (50 \text{ N})^2 + (120 \text{ N})^2 \quad \therefore F_R = 130 \text{ N}$$

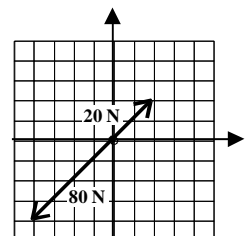
$$\therefore \tan A = \frac{50}{120} = 0.4166 \quad \therefore A = 22.6^\circ$$

Answer : 130 N, N 23° E

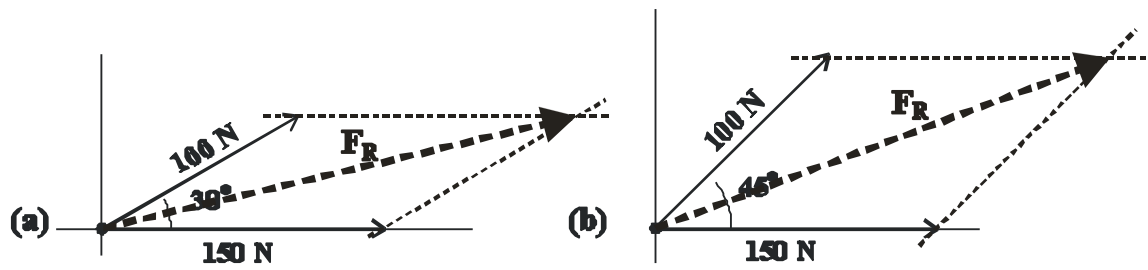


- e) 20 N Northeast and 80 N Southwest

$$80 \text{ N Southeast} + 20 \text{ N Northeast} = 60 \text{ N Southwest}$$

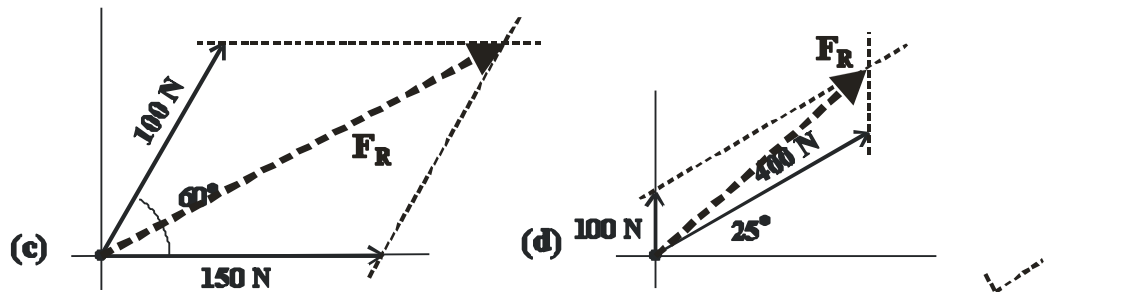


2. Mathematically, find the resultant of the following concurrent forces and sketch each resultant force. Round off your answers to the nearest whole number.



$F_R = 242 \text{ N, E } 12^\circ \text{ N}$

$F_R = 232 \text{ N, E } 18^\circ \text{ N}$



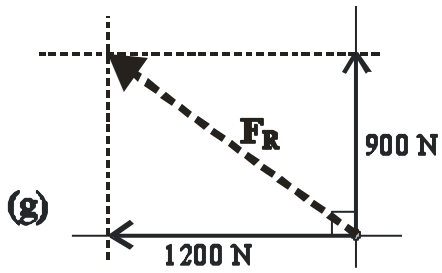
$F_R = 218 \text{ N, E } 23^\circ \text{ N}$

$F_R = 452 \text{ N, E } 37^\circ \text{ N}$

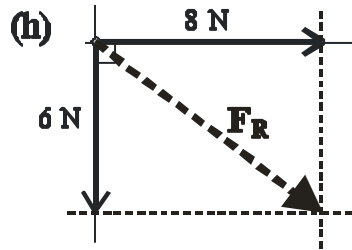


$F_R = 110 \text{ N, E } 13^\circ \text{ N}$

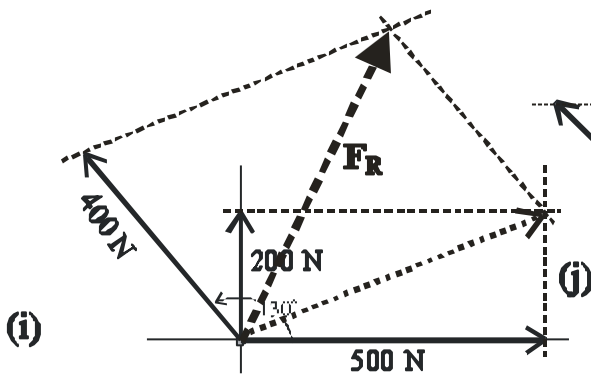
$F_R = 187 \text{ N, E } 67^\circ \text{ E}$



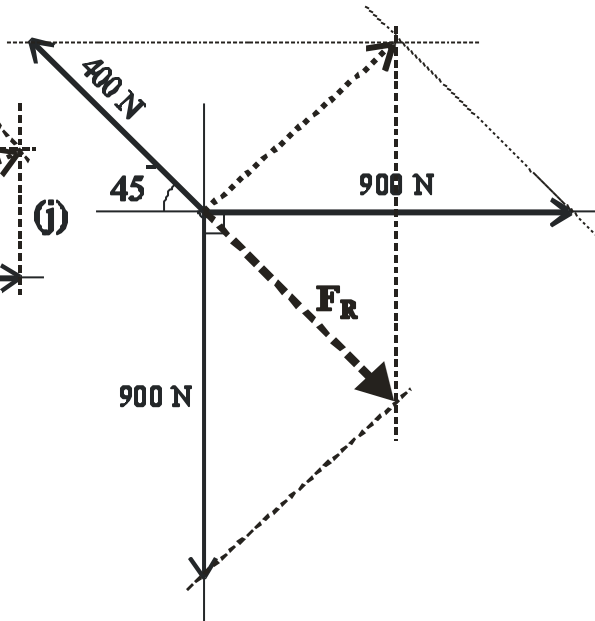
$F_R = 1500 \text{ N, W } 37^\circ \text{ N}$



$F_R = 10 \text{ N, S } 53^\circ \text{ E}$



$F_R = 561 \text{ N, E } 64^\circ \text{ N}$



$F_R = 873 \text{ N Southeast}$

