Answer on question #56581, Physics / Other

Question 1.) Josef and Mhel push on a box. Mhel pushes with a force of 120 N to the east. Josef exerts a force of 160 N to the north. What is the size and direction of the resultant force on the box?

2.) While flying due east at 110 km/h, a jet is also carried northward at 40 km/h by the wind blowing due north. What is the jets resultant velocity?

Solution 1.The size will be

$$F = \sqrt{120^2 + 160^2} = 200$$

The direction will be

$$\alpha = \arctan \frac{160}{120} \approx 53.13^\circ$$

alpha is angel from north to east.
2. Velocity is

$$v = \sqrt{110^2 + 40^2} \approx 117\, km/h$$

The direction is

$$\alpha = \arctan \frac{110}{40} \approx 70^\circ$$

alpha is angel from east to north.