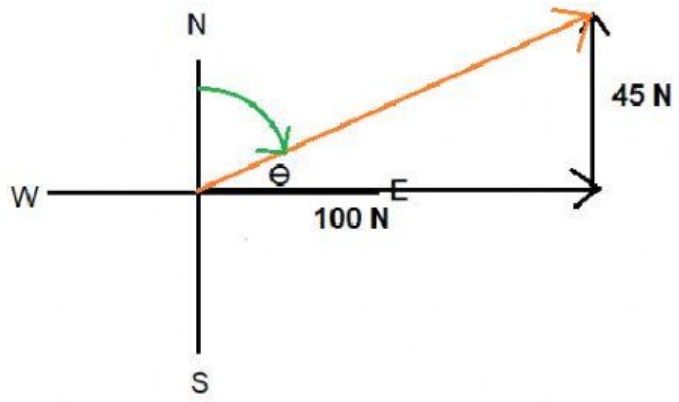
Newton worksheet 4

Remember to draw the Cartesian plane where the 2 tails meet.



To determine the green angle you need to go all the way to the 90° and then subtract Θ

Bearing = 90° - 24,23

= 65,77 °

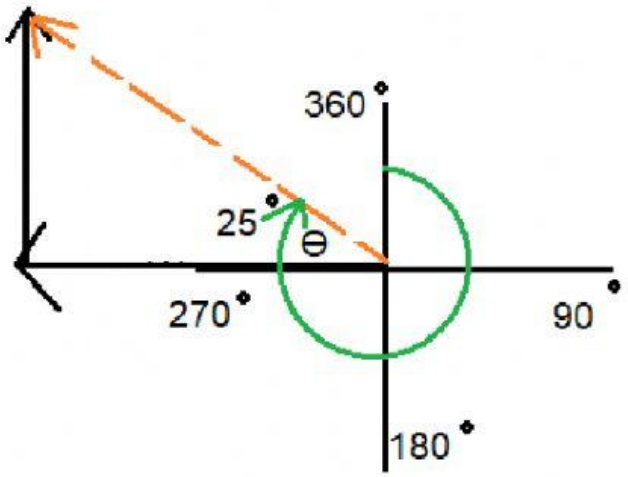
Final answer Fnet = 109,66 N at a bearing of 65,77°

Bearing

Bearing is quite a tricky concept

Look at the following examples of just how to calculate the bearing:

1.

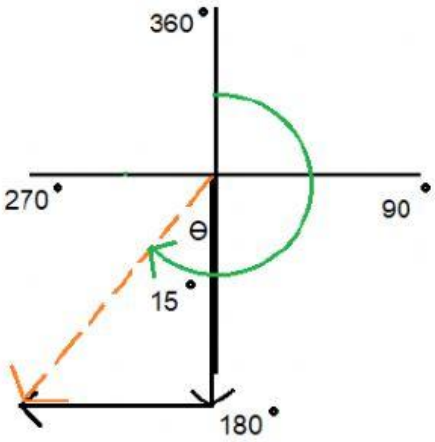


Bearing = _____° + Θ

= _____ + 25

= _____°

2.

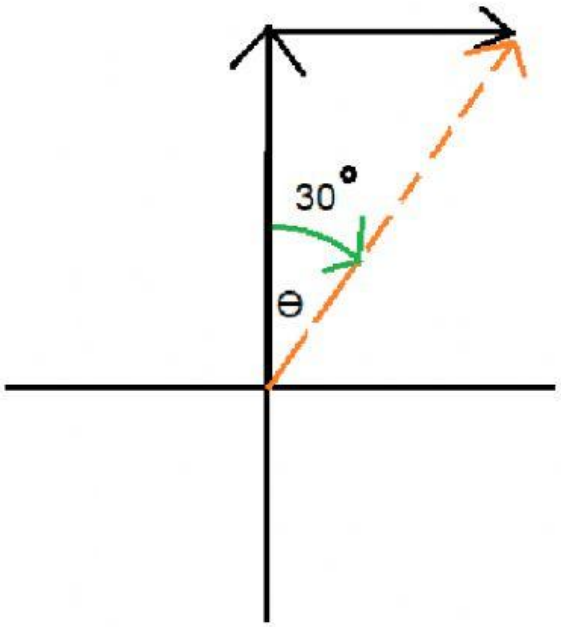


Bearing = _____° + Θ

= _____° + 15

= _____°

3.

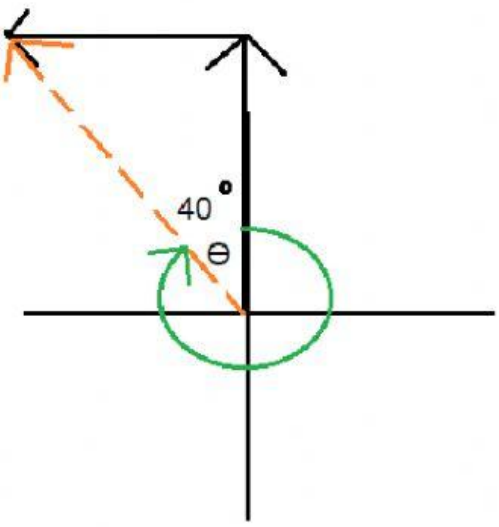


Bearing = Θ

(since the green angle is literally measured clockwise from the north)

= 30°

4.



Bearing = _____° - Θ

= _____° – 40

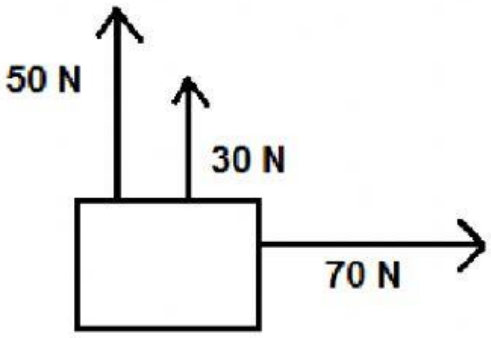
= _____°

Exercise 4:

- ✓ Ensure that you include the direction whenever you answer force, since it is a vector
- ✓ Don't leave any spaces between the values and the unit
- ✓ Round each answer below off to 2 decimal places
- ✓ Use the terms upwards, downwards, left and right where appropriate
- ✓ Leave out the degrees symbol when answering for the angles

Determine the magnitude and direction of the net (resultant) force of the following:

1. Jordan and David each pull a crate up with force of 50 N and 30 N respectively at a bearing of 0°, Ally then pulls the crate to the right with a force of 70 N at a 90° bearing.



F_x = _____ _____

Answer value and unit

Direction

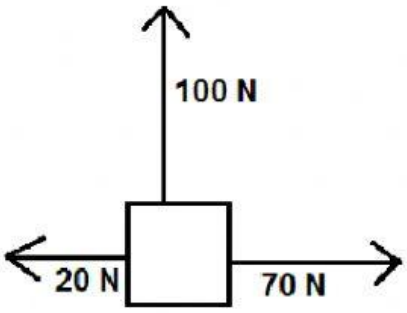
F_{ynet} = _____ _____

F_{net} = _____

Θ = _____°

Bearing = _____°

2.



F_{xnet} = _____ _____

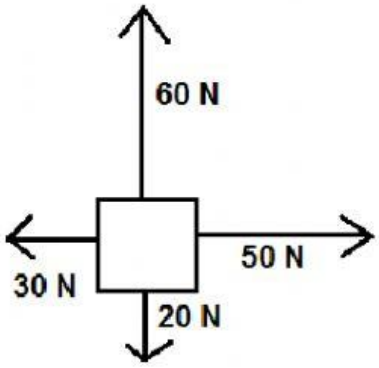
F_y =_____ _____

F_{net} = _____

Θ = _____°

Bearing = _____°

3. Keziah exerts a force of 60 N north, Siphokazi exerts a force of 20 N south. Tom and Jared then exert a force of 50 N east and 30 N west respectively on the box.



F_{xnet} = _____ _____

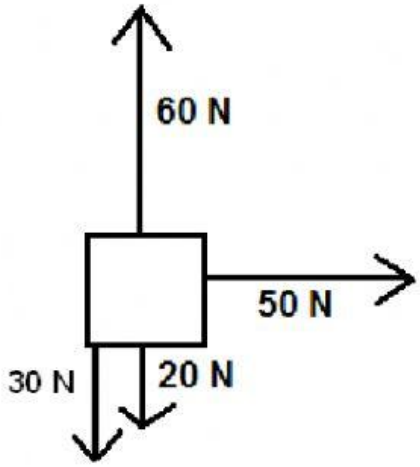
F_{ynet} = _____ _____

F_{net} = _____

Θ = _____°

Bearing = _____°

4.



F_x = _____ _____

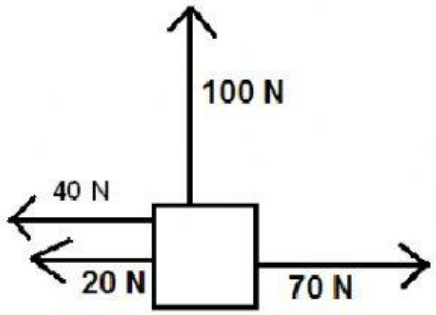
F_{ynet} = _____ _____

F_{net} = _____

Θ = _____°

Bearing = _____°

5.



F_{xnet} = _____ _____

F_y = _____ _____

F_{net} = _____

Θ = _____

Bearing = _____

6. Danielle exerts a force of 50 N on a box to the right and Markus exerts a force of 30 N to the left. Joshua and James then exerts a force of 40 N each on the box in a downwards direction. Calculate the net force on the box.

F_{xnet} = _____ _____

F_y = _____ _____

F_{net} = _____

Θ = _____°

Bearing = _____°

7. If Banele exerts a force of 100 N to the west on a trolley and Tyler exerts a force of 140N to the East on the trolley, while Shanique pulls the trolley with a force of 20 N north.

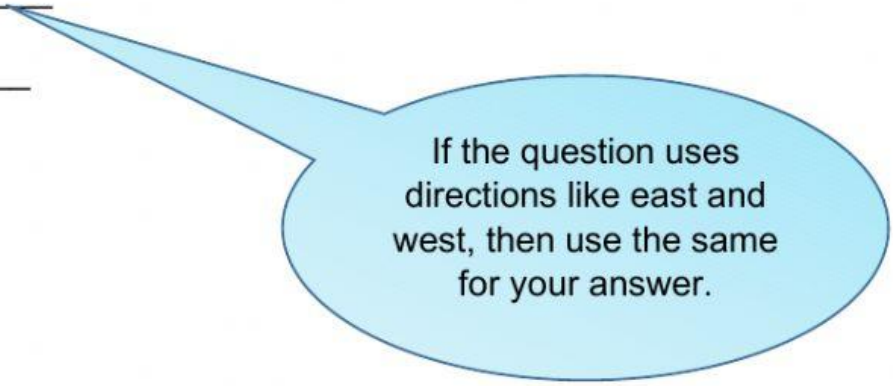
F_{xnet} = _____ _____

F_y = _____ _____

F_{net} =_____

Θ = _____°

Bearing = _____°



8. If Carol exerts a 5 N force upwards and Maxine exerts a 4 N force on a box to the right, calculate the net force on the box

F_x = _____ _____

F_y = _____ _____

F_{net} = _____

Θ = _____°

Bearing = _____°

9. Retha picks up a 2 kg bag with a force of 70 N. The weight (gravitational force) on the bag is 19,6 N. Calculate the net force on the bag

Fnet = _____ _____

10. Snalo picks up a bag with a mass of 4kg with a force of 80N

Fnet = _____ _____

11. James exerts a force of 1000 N to pick up a box with a mass of 60 kg.

Fnet = _____ _____