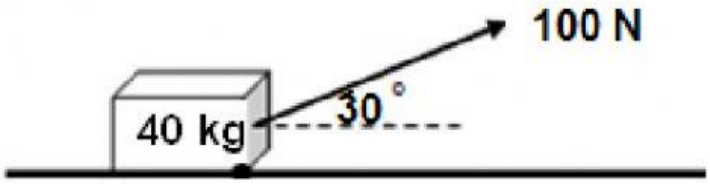
Newton laws worksheet 14

Exercise 13

Calculate the (a)Fnet and (b) acceleration of the following blocks {round off to 2 decimal places and leave no spaces between values and units}

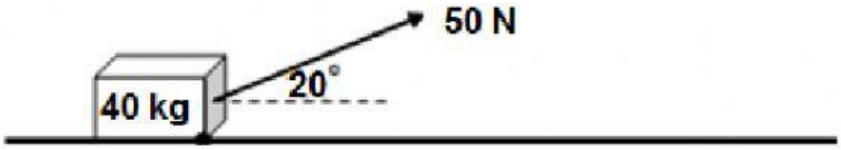
13.1



Fnet = _____ _____ ← {direction)

a = _____ _____

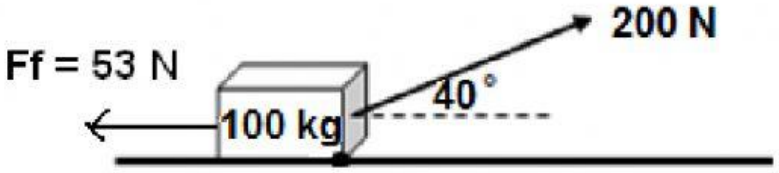
13.2



Fnet = _____ _____

a = _____ _____

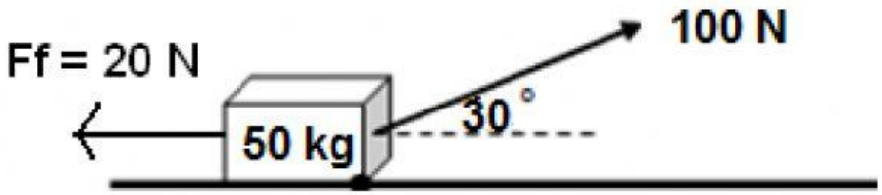
13.3



Fnet = _____ _____

a = _____ _____

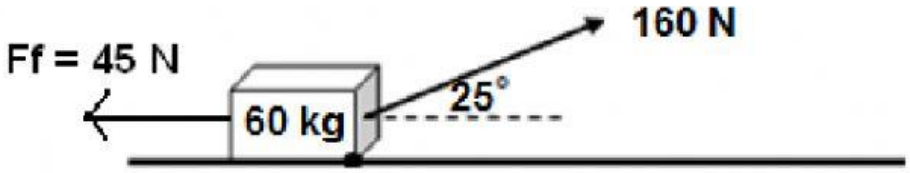
13.4



Fnet = _____ _____

a = _____ _____

13.5

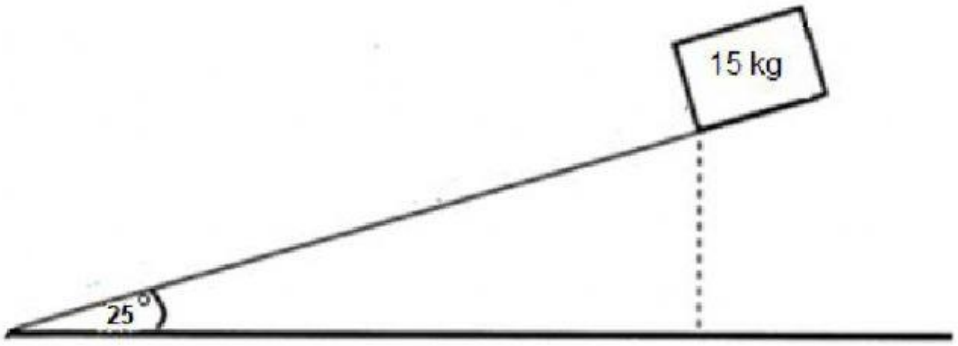


Fnet = _____ _____

a = _____ _____

Calculating acceleration on a slope

Eg 1



Focus on the forces that run parallel to the slope

You don't need to calculate the normal force here

The only force that is going to cause this box to move is the gravitational force pulling it down the slope (parallel to the slope)

Fnet = m.a

Fgll = m.a

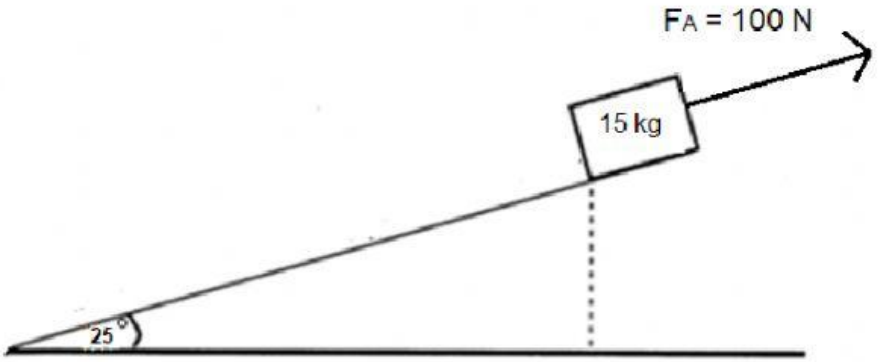
Fg.sin Θ = m.a

15(9,8).sin 25° = 15.a

a = 4,14 $m.s^{-2}$ down the slope

Eg 2 The object below I pulled up the slope with an applied force of 100N, causing it to accelerate up the slope.

Thus we know the F_A is greater than the Fgll



Fnet = m.a

F_A - Fgll = m.a

F_A - Fg.sin Θ = m.a

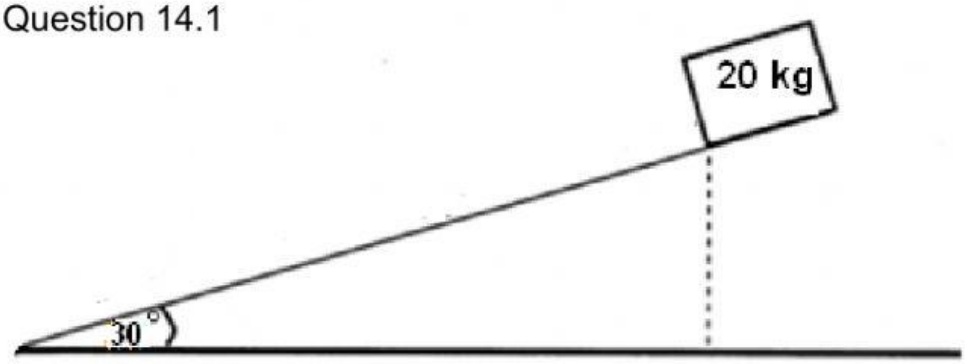
$100 - 15(9,8).\sin 25° = 15.a$

$a = 2,53\ m.s^{-2}$ up the slope

Exercise 14

Complete the following exercise in your workbook

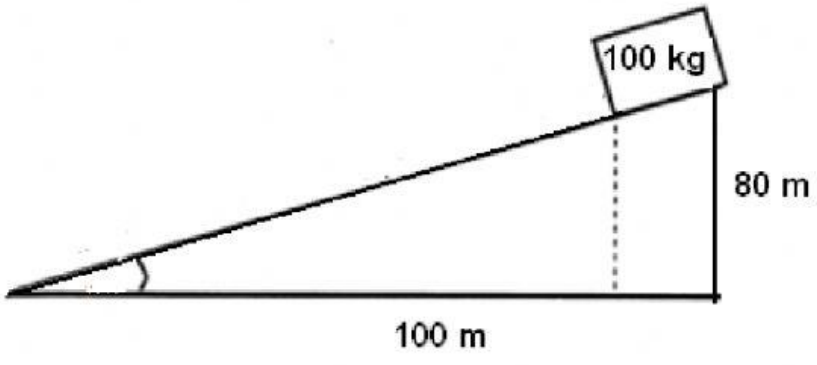
Question 14.1



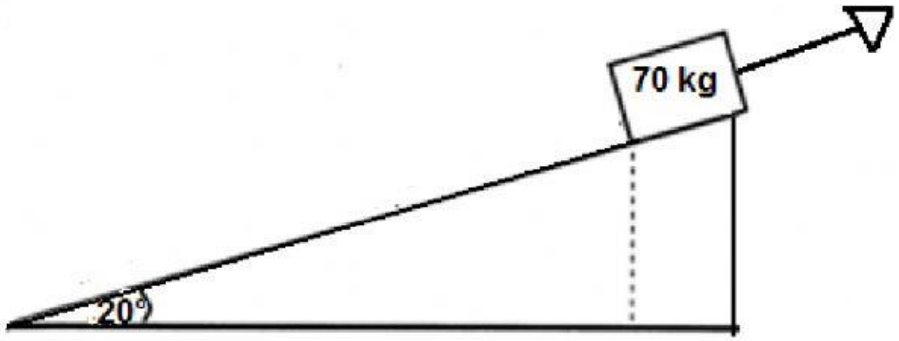
Calculate the acceleration of the block above.

Question 14.2

Calculate the magnitude of the force that will prevent an object with a mass of 100 kg resting on a slope, as indicated in the diagram, from sliding down the slope.



Question 14.3



Calculate the force that needs to be exerted on the box upwards in order for the box to experience an acceleration of $4 m.s^{-2}$ up the slope.

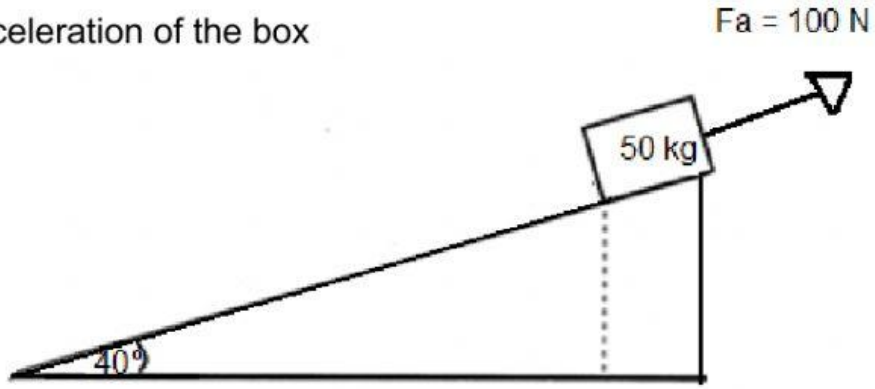
Question 14.4

If a force of 100 N is exerted on the box, calculate the:

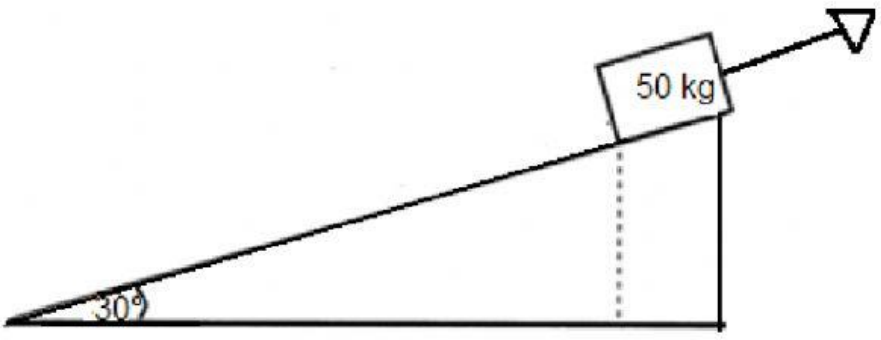
14.4.1 Which force is greater, Fa or Fgll

14.4.2 the net force on the object

14.4.3 the acceleration of the box

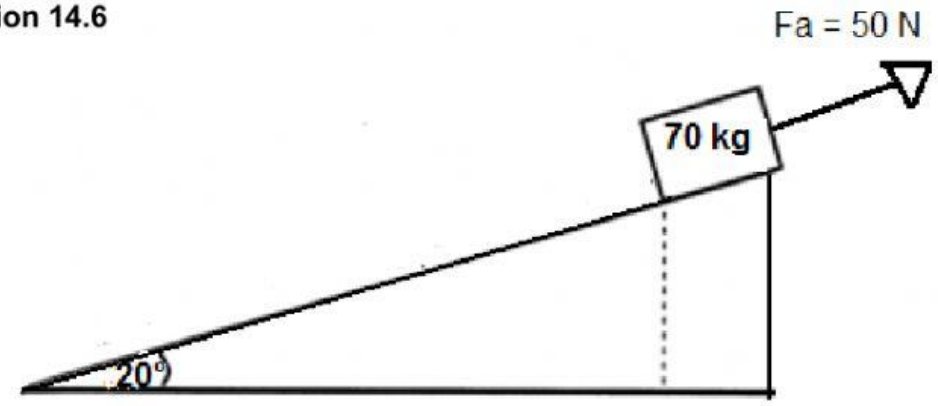


Question 14.5



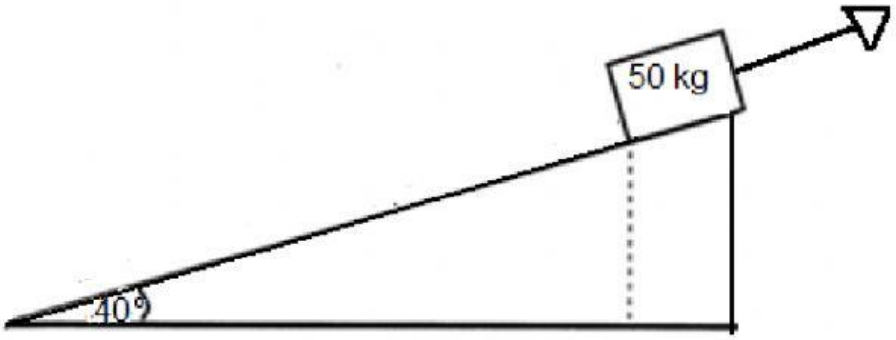
Calculate the acceleration of the box.

Question 14.6



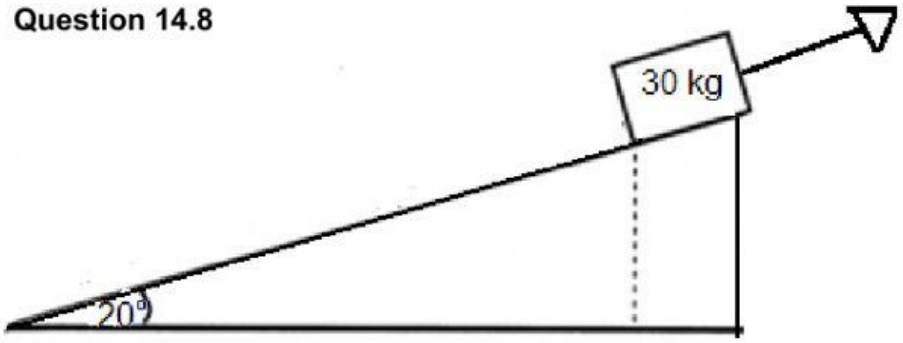
Calculate the acceleration of the box.

Question 14.7



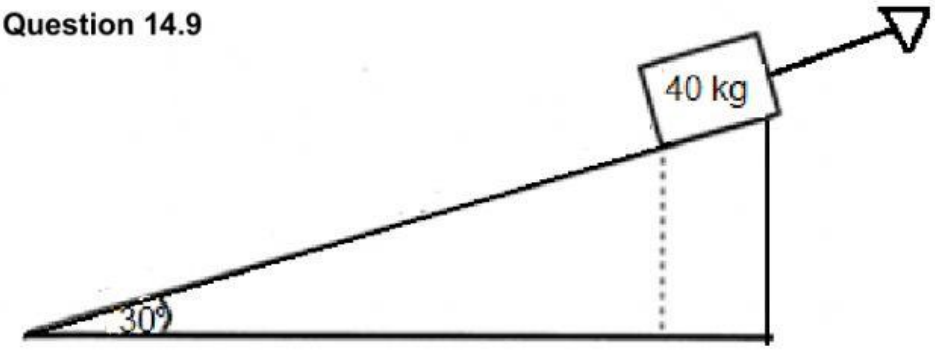
Calculate the F_a on the box, if the acceleration of the box is $2 m.s^{-2}$ upwards.

Question 14.8



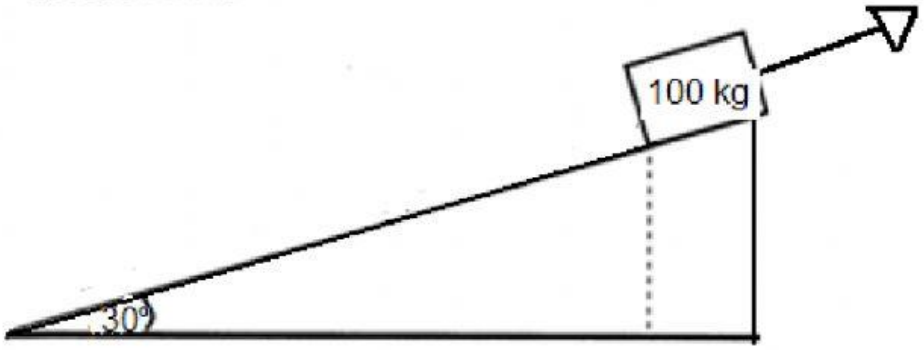
Calculate the force that needs to be applied to keep the box from sliding down the slope.

Question 14.9



Calculate the force that needs to be applied to keep the box from sliding down the slope.

Question 14.10



Calculate the force applied to the box upwards in order for the box to accelerate down the slope at $1 m.s^{-2}$