EXAM PAPERS PRACTICE

GCSE OCR Math J560

Speed, Density & Pressure

Question Paper

"We will help you to achieve A Star "

Question 1

Manchester airport is on a bearing of 330° from a London airport.

(a) Find the bearing of the London airport from Manchester airport.

[2 marks]

Question 2

Peter goes for a walk.
He walks 15 miles in 6 hours.

(a) Work out Peter's average speed.
Give your answer in miles per hour.

[2 marks]

Question 3

Gary drove from London to Sheffield.
It took him 3 hours at an average speed of 80 km/h.

Lyn drove from London to Sheffield.
She took 5 hours.

Assuming that Lyn
drove along the same roads as Gary
and did not take a break,

(a) work out Lyn's average speed from London to Sheffield.

[3 marks]

Question 4

Axel and Lethna are driving along a motorway.

They see a road sign.
The road sign shows the distance to Junction 8
It also shows the average time drivers take to get to Junction 8

To Junction 8 30 miles 26 minutes

The speed limit on the motorway is 70 mph.

Lethna says

"We will have to drive faster than the speed limit to drive 30 miles in 26 minutes."

Is Lethna right?
You must show how you get your answer.

[3 marks]

Question 5

A box exerts a force of 140 newtons on a table.
The pressure on the table is 35 newtons/m^2.

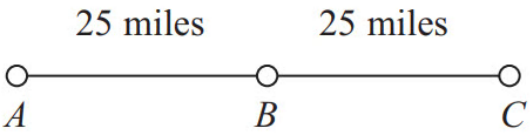
Calculate the area of the box that is in contact with the table.

$$p = \frac{F}{A}$$

p = pressure
F = force
A = area

[3 marks]

Question 6



A, B and C are 3 service stations on a motorway.

$AB = 25$ miles
$BC = 25$ miles

Aysha drives along the motorway from A to C.

Aysha drives at an average speed of 50 mph from A to B.
She drives at an average speed of 60 mph from B to C.

Work out the difference in the time Aysha takes to drive from A to B and the time Aysha takes to drive from B to C.
Give your answer in minutes.

[3 marks]

Question 7

The diagram shows a solid triangular prism.

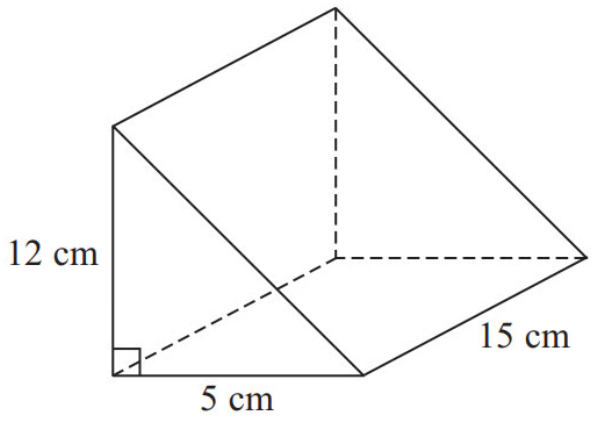


Diagram **NOT** accurately drawn

The prism is made from metal.
The density of the metal is 6.6 grams per cm^3.

Calculate the mass of the prism.

[3 marks]

Question 8

Axel and Lethna are driving along a motorway.

They see a road sign.
The road sign shows the distance to Junction 8
It also shows the average time drivers will take to get to Junction 8

To Junction 8
30 miles 26 minutes

The speed limit on the motorway is 70 mph.

Lethna says,

'We will have to drive faster than the speed limit to go 30 miles in 26 minutes.'

Is Lethna right?
You must show how you got your answer.

[3 marks]

Question 9

The diagram shows a metal bar in the shape of a prism.

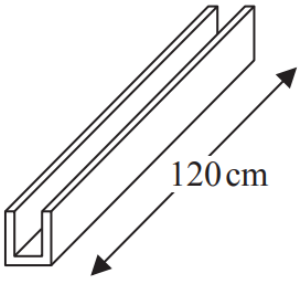


Diagram **NOT** accurately drawn

The length of the metal bar is 120 cm.
The cross section of the metal bar is shown below.

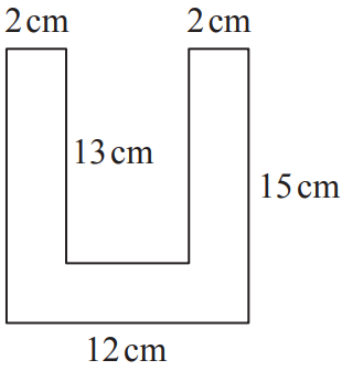


Diagram **NOT** accurately drawn

All corners are right angles.

The metal bar is made from steel with density 8 g/cm^3.

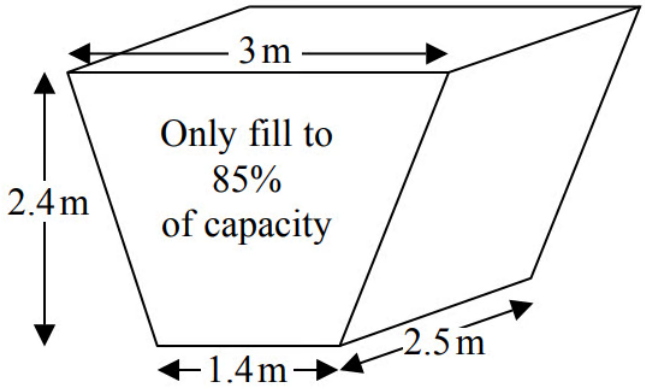
Sean has a trolley.
The trolley can carry a maximum mass of 250 kg.

How many metal bars can the trolley carry at the same time?
You must show your working.

[5 marks]

Question 10

The diagram shows an oil tank in the shape of a prism.
The cross section of the prism is a trapezium.



The tank is empty.

Oil flows into the tank.
After one minute there are 300 litres of oil in the tank.

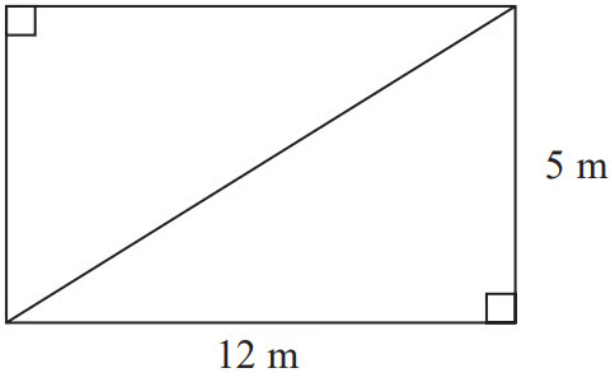
Assume that oil continues to flow into the tank at this rate.

(a) Work out how many **more** minutes it takes for the tank to be 85% full of oil.
($1\ m^3 = 1000$ litres)

[5 marks]

Question 11

This rectangular frame is made from 5 straight pieces of metal.



The weight of the metal is 1.5 kg per metre.

Work out the total weight of the metal in the frame.

[5 marks]

Question 12

Tame Valley is a company that makes yoghurt.

A machine fills trays of 20 pots with yoghurt.
In one hour, the machine fills a total of 15000 pots.

Work out how many seconds the machine takes to fill each tray of 20 pots.

[4 marks]

Question 13

There are 18500 gallons of fuel in a fuel tank.

The fuel is pumped from the fuel tank into a plane at a rate of 1700 litres per minute.

1 gallon = 4.5 litres.

How many minutes will it take to empty the fuel tank completely?
Give your answer to the nearest minute.

[3 marks]

Question 14

A force of 70 newtons acts on an area of 20 cm^2

The force is increased by 10 newtons.
The area is increased by 10 cm^2

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Helen says,

"The pressure decreases by less than 20%"

Is Helen correct?
You must show how you get your answer.

[3 marks]

Question 15

$$\text{Pressure} = \frac{\text{force}}{\text{area}}$$

Find the pressure extered by a force of 900 newtons on an area of $60\,\text{cm}^2$.
Give your answer in newtons/m^2.

[2 marks]