Written by

1st Class Maths

With solutions by

The Maths Guy

Video Solutions*

SCAN ME

*Available from 5pm (ish)

PRACTICE PAPER FOR

AQA Paper 3H (June 2023)

---------- Disclaimer ----------

In 2022 I wrote a series of predicted papers that in many cases reflected the real exam paper very well. This was due to the exam boards providing advance information on the topics that were going to be in each paper. This information is no longer provided so "predicting" a paper is not possible. Nobody can know what topics and types of questions will come up in each paper, apart from the few examiners that write them.

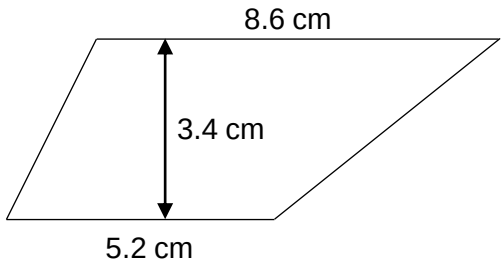
This paper has been created based on the **most common** paper 2/3 topics from previous years as well as careful analysis of the topics that have already appeared in paper 1/2. The paper should be excellent at helping students revise for exams, however should not be relied upon as the basis for revision. The topics from this paper may well appear in the real exams, however there is absolutely no guarantee of this for the reasons previously mentioned. Some topics may appear, some may not.

Ultimately the best way to prepare for the exams is to **revise all topics**.

Do not write outside the box

Answer **all** questions in the spaces provided.

1



Not drawn accurately

Work out the area of this trapezium **[2 marks]**

Answer _____ cm^2

2 The probability that a biased coin lands on heads is 0.35
The coin in thrown 80 times. **[2 marks]**

Work out an estimate for the number of times the coin lands on **tails**.

Answer _____

Do not write outside the box

3 (a) Factorise fully $6xy + 15x^2$ **[2 marks]**

Answer _____

3 (b) Solve $(2x + 1)(x + 1) = 0$ **[2 marks]**

Answer _____

4 $\mathbf{a} = \begin{pmatrix} 15 \\ -6 \end{pmatrix}$

$4\mathbf{a} = 3\mathbf{b}$ **[2 marks]**

Work out the vector **b**

Answer _____

10

Do not write outside the box

5 (a) Use your calculator to work out the value of $\frac{29.79^3}{0.49}$ **[1 mark]**

Write down your full calculator display.

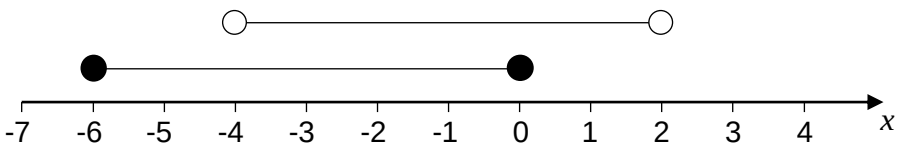
Answer _____

5 (b) Use approximations to 1 significant figure to check if your answer to part (a) is sensible. **[3 marks]**

Tick a box

☐ Sensible ☐ Not sensible

6 Two inequalities are represented on the number line below.



Write down all of the integers that satisfy both inequalities. **[2 marks]**

Answer _____

Do not write outside the box

7 Work out the highest common factor (HCF) of 63 and 105 **[2 marks]**

Answer _____

8 Here is some information about age of 25 cars for sale at a car dealership.

Age of car (years)	Number of cars
0	12
1	4
2	4
3	4
4	1

8 (a) Write down the modal age of the cars. **[1 mark]**

Answer _____

8 (b) Work out the median age of the cars. **[2 marks]**

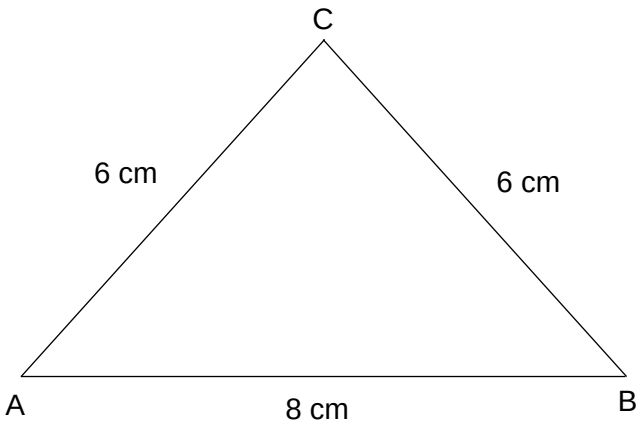
Answer _____

11

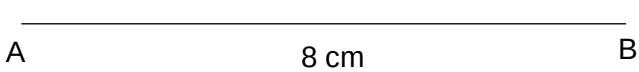
Do not write outside the box

9 ABC is an isosceles triangle.
The perimeter of triangle ABC is 20 cm
AB = 8 cm

Rhia constructs a possible triangle for ABC.
Rhia's triangle is shown below.

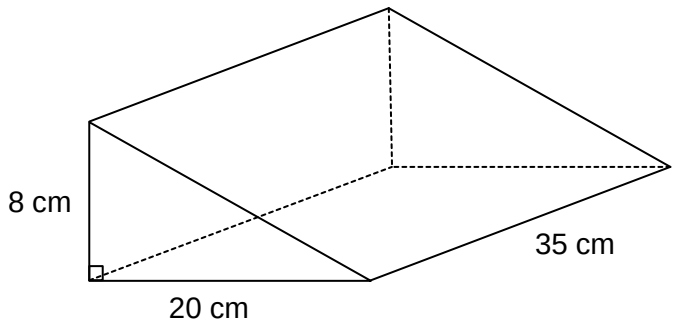


Using ruler and compasses only, construct another possible triangle ABC.
Your triangle **must** be different to Rhia's.
The line AB has been drawn for you. **[3 marks]**



Do not write outside the box

10 The triangular prism below is made from metal.
The metal has a density of 4.5 g/cm^3 (to 1 decimal place).



10 (a) Complete the error interval for the density of the metal. **[2 marks]**

_____ g/cm^3 ≤ density < _____ g/cm^3

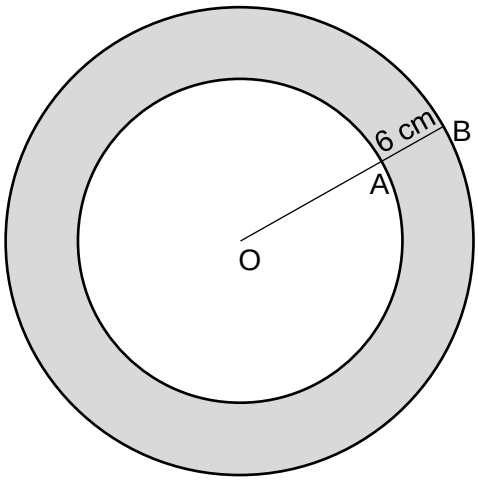
10 (b) Assume instead that the density of the metal is **exactly** 4.5 g/cm^3
Work out the mass of the prism in grams. **[4 marks]**

Answer _____ grams

9

Do not write outside the box

11 Here are two circles with centre O.



The radius of the smaller circle is OA.
The radius of the larger circle is OB.
AB = 6cm.

OA : AB = 3 : 1

Calculate the shaded area.
Give your answer to 1 decimal place.

[4 marks]

Answer _____ cm^2

Do not write outside the box

12 y is directly proportional to x

Complete the table.

[2 marks]

y	3	30	
x	30		15

13 $\dfrac{(7^{100})^2}{7^{-50}} = 7^k$

Work out the value of k

[2 marks]

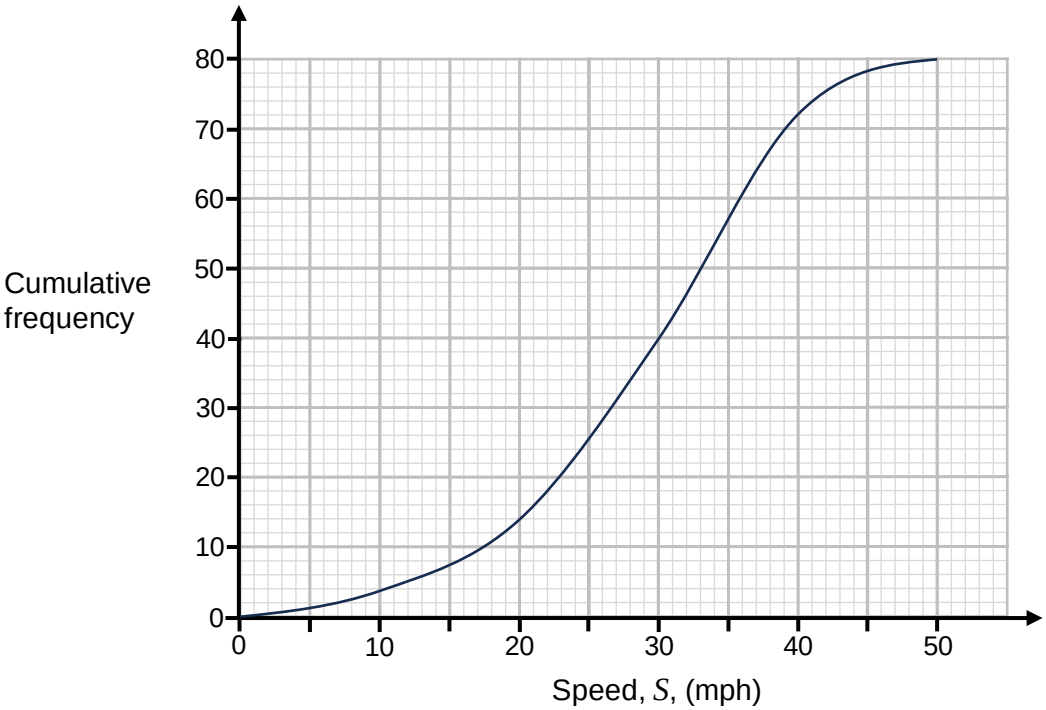
$k =$ _____

8

Turn over ►

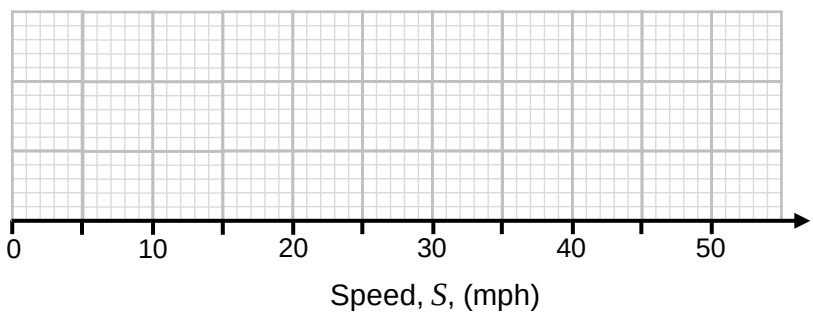
Do not write outside the box

14 The cumulative frequency diagram shows information about the average speeds, S, of 80 vehicles travelling on a road during an hour.



14 (a) The slowest vehicle was travelling at 5 mph.
The fastest vehicle was travelling at 50 mph.

On the grid below, draw a box plot for the speeds of the 80 vehicles. **[3 marks]**



Do not write outside the box

14 (b) The speed limit for the road is 40 mph.
Work out the percentage of the vehicles that were breaking the speed limit.

[2 marks]

Answer _____ %

15 $2a : b = 3 : 5$
$9b : 5c = 2 : 1$

Work out the ratio $a : c$
Give your answer in its simplest form.

[4 marks]

Answer _____ : _____

9

Turn over ►

Do not write outside the box

16 h is inversely proportion to r^2

$h = 200$ when $r = 0.5$

16 (a) Work out an equation connecting h and r. **[3 marks]**

Answer _____

16 (b) Work out the value of h when $r = \frac{1}{8}$ **[2 marks]**

Answer _____

Do not write outside the box

17 Colin has a scale model of a statue.

The height of the model statue is 12 cm.
The height of the real statue is 3 m.

Colin calculates the volume of model statue to be 180 cm^3

Work out the volume of the real statue.
Give your answer in **m^3**

[4 marks]

Answer _____ m^3

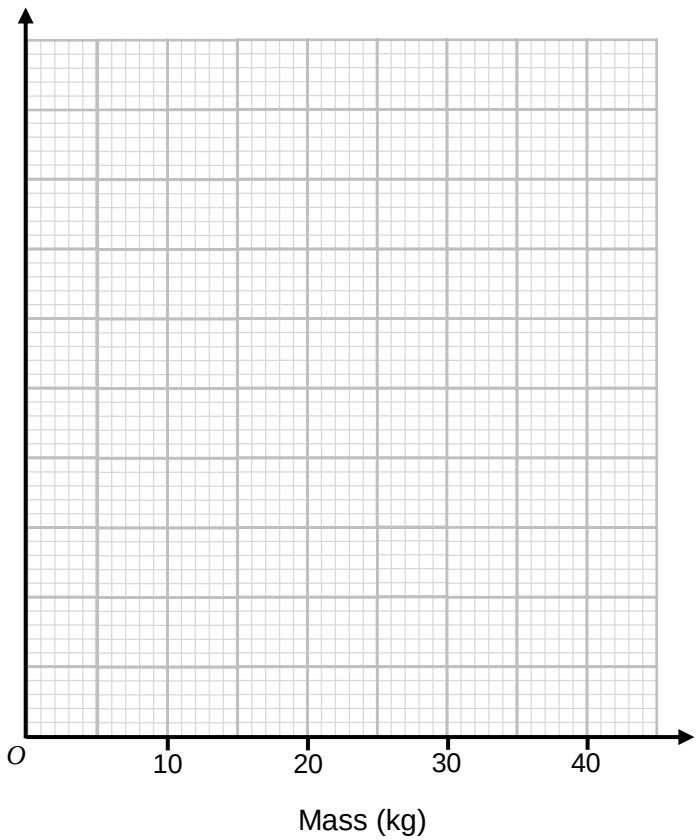
9

Do not write outside the box

18 Here is some information about the masses, m, of 50 goats.

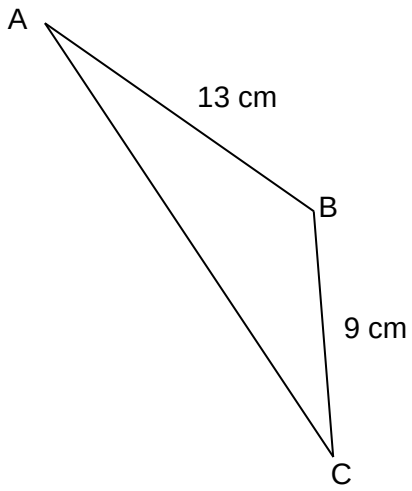
Mass, m, (kg)	**Frequency**	
$0 < m \leq 20$	4	
$20 < m \leq 25$	24	
$25 < m \leq 30$	13	
$30 < m \leq 45$	9	

On the grid below, draw a histogram to represent the information. **[3 marks]**



Do not write outside the box

19 ABC is a triangle with an area of 21 cm^2



Not drawn accurately

Angle ABC is an obtuse angle.
Work out the size of angle ABC.
Give your answer to 1 decimal place.

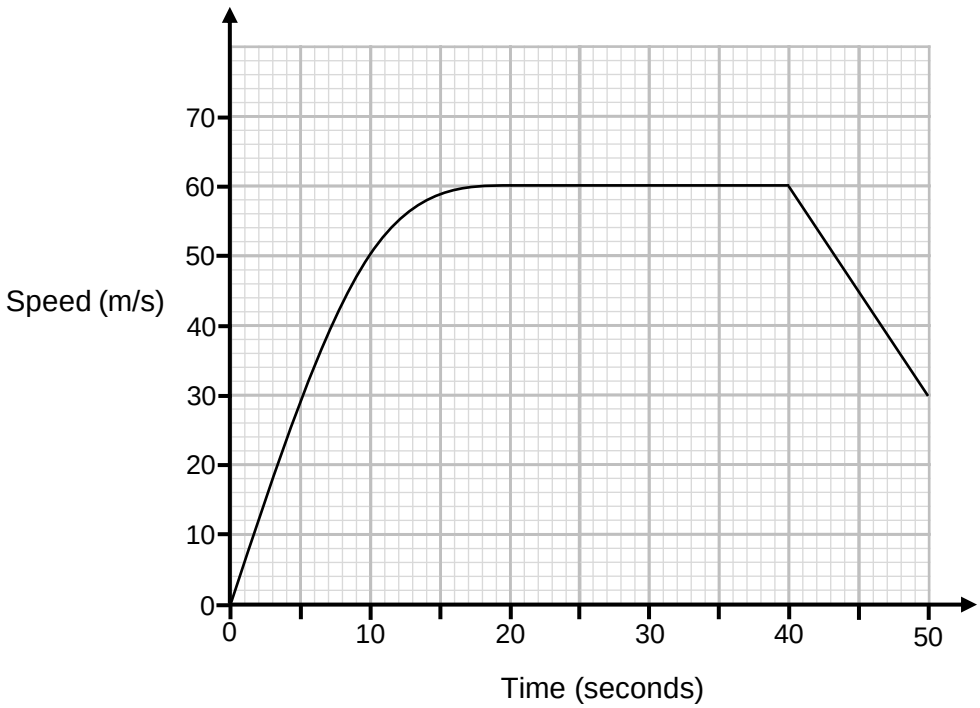
[3 marks]

Answer _____ °

6

Do not write outside the box

20 The graph shows the speed of a race car the first 50 seconds of a journey.



20 (a) Work out an estimate for the acceleration of the car 10 seconds after it starts moving. State the units of your answer. **[3 marks]**

Answer _____

20 (b) Describe the motion of the car between 20 and 40 seconds. **[1 mark]**

Do not write outside the box

20 (c) Show that the car travels a total distance of more than 2250 metres. **[4 marks]**

21 Solve $2(x + 3)(x + 4) < 84$ **[4 marks]**

Answer _____

12

Do not write outside the box

22 Two ships leave a port.
Ship A travels in a straight line on a bearing of 050°
Ship B travels in a straight line on a bearing of 085°

Both ships travel at constant speeds.

Speed of Ship A : Speed of Ship B = 3 : 4

After $1\frac{1}{2}$ hours the shortest distance between the two ships is 45 km.

Work out the speed of Ship A in km/h
Give your answer to 1 decimal place.

[6 marks]

Answer _____ km/h

6