Every Topic on the Edexcel 2022 Advanced Information Practice Booklet Paper 3 (Calculator)

Higher Tier

GCSE Maths Tutor

How it all Works!

Work through the practice booklet, scan the code, watch the live tutorial and check your answers!

Try it out!

Answer ALL questions.
Write your answers in the spaces provided.
You must write down all the stages of your working.

1. a) Write $\frac{3^2 \times 3^5}{3^3}$ as a power of 3

b) Write down the value of $\frac{5^7 \times 5^{-3}}{5^2}$

.....
(2 marks)

.....
(2 marks)

---

2. $$v = \frac{s}{t}$$

$s = 2.34$ correct to 2 decimal places.

$t = 1.3$ correct to 1 decimal place.

Work out the lower bound for v.

Give your answer correct to 2 decimal places.

.....
(3 marks)

3. A train takes 3 hours to complete a journey correct to the nearest 5 minutes.

The length of the journey is 260 miles correct to the nearest 10 miles.

By considering bounds, work out the average speed of the train.

Give a reason for your answer.

.....

(5 marks)

4. Jeff is choosing a shrub and a rose tree for his garden.

At the garden centre there are 17 different types of shrubs and some rose trees.

Jeff says,

"There are 215 different ways to choose one shrub and one rose tree."

Could Jeff be correct?

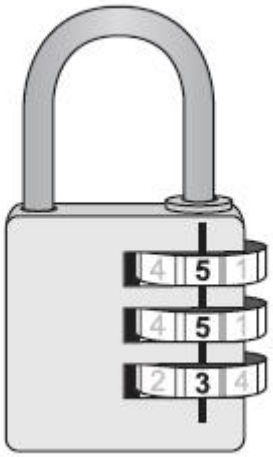
You must show how you get your answer.

(2 marks)

5. There are three dials on a combination lock.

Each dial can be set to one of the numbers 1, 2, 3, 4, 5

The three digit number 553 is one way the dials can be set, as shown in the diagram.



a) Work out the number of different three digit numbers that can be set for the combination lock.

.....

(2 marks)

b) How many of the possible three digit numbers have three different digits?

.....

(2 marks)

---

6. Simplify $3x^2 - 5 - 4x + 2x^2 - 1 + 7x$

.....

(1 mark)

7. Expand and simplify $3(2x + 5) + 5(x - 2)$

.....

(2 marks)

8. Work out the value of $2x^2 - 3x$ when $x = 4$

.....

(2 marks)

9. a) Make x the subject of $3x + y = zx - 3z$

.....

(3 marks)

b) Make x the subject of $y = \sqrt{\frac{x+2}{x-p}}$

.....

(3 marks)

10. a) Expand and Simplify $(x+3)(x+4)(x+1)$

.....

(3 marks)

b) Expand and Simplify $(2x+3)(x-4)(3x-2)$

.....

(3 marks)

11. a) Factorise x^2-100

.....

(1 mark)

b) Simplify $\frac{2x^2-7x-4}{x^2-16}$

.....

(3 marks)

12. Solve the simultaneous equations:

$$3x - 5y = -31$$

$$4x - 2y = -18$$

x = ...

y = ...

(3 marks)

---

13. Solve the simultaneous equations:

$$8x + 3y = 2$$

$$3x - 2y = -5.5$$

x = ...

y = ...

(3 marks)

14. Solve the simultaneous equations:

$$x^2 + y^2 = 34$$

$$x - y = 2$$

x = ...

y = ...

(5 marks)

15. a) Decrease 80 by 20%

.....
(1 mark)

b) Decrease 240 by 4%

.....
(1 mark)

16. Amy buys a new car for £18,000.

Each year the car depreciates by 12%.

How much will the car be worth at the end of 3 years.

.....
(3 marks)

17. A washing machine has been reduced in a sale by 20%.

The sale price is £512.

Work out the original cost of the washing machine.

.....
(3 marks)

18. A new printer costs £288 once 20% VAT has been added on.

Work out the cost of the printer before VAT.

.....

(3 marks)

19. In a box of cereal, 40% of the weight is nuts.

The rest of the cereal is corn.

Write the ratio of the weight of nuts to the weight of corn.

Give your answer in the form $1 : n$

.....

(2 marks)

20. Maria, Dylan and Kate share £3000.

The ratio of the amount Maria gets to the amount Dylan gets is in the ratio 5:4.

Kate gets 1.5 times the amount Dylan gets.

Work out the amount of money that Dylan gets.

.....

(4 marks)

21. A shop sells small chocolate bars and large chocolate bars.

The small chocolate bars are sold in packs of 4.

The large chocolate bars are sold in packs of 9.

One day:

The packs of small bars sold : The packs of large bars sold = 5 : 2

A total of 95 chocolate bars were sold.

Work out the number of small chocolate bars sold.

.....

(4 marks)

22. y is directly proportional to $\sqrt[3]{x}$

$y = 1\frac{1}{6}$ when $x = 8$

Find the value of y when $x = 64$

.....

(3 marks)

23. A train travelled from Manchester to London.

Train A left Manchester at 8:35am and arrived in London at 11:05am.

The train travelled at an average speed of 110mph.

Train B also left Manchester at 8:35am but was diverted by an extra 37 miles.

The train got to London at 11:35am.

Work out the difference between the average speed of train A and train B.

.....

(4marks)

24. Harry travels from Appleton to Brockley at an average speed of 50mph.
He then travels from Brockley to Cantham at an average speed of 70mph.

Harry takes a total time of 5 hours to travel from Appleton to Cantham.
The distance from Brockley to Cantham is 210 miles.

Calculate Harry's average speed for the total distance travelled from Appleton to Cantham.

.....

(4 marks)

---

25. Using $x_{n+1} = \frac{5}{x^2{}_n + 3}$

With $x_0 = 1$

Find the values of x_1, x_2 and x_3

$x_1 =$ .....

$x_2 =$ .....

$x_3 =$ .....

(3 marks)

26. a) Show that the equation $2x^3 - x^2 - 3 = 0$ has a solution between $x = 1$ and $x = 2$

(2 marks)

b) Starting with $x_0 = 1$, use the iteration formula $x_{n+1} = \sqrt{\frac{3}{2x_n - 1}}$ twice to find an estimate for the solution to $2x^3 - x^2 - 3 = 0$

.....

(3 marks)

27.

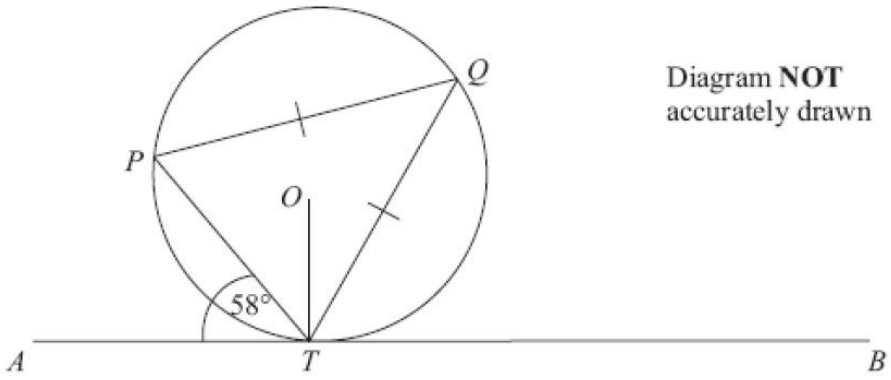


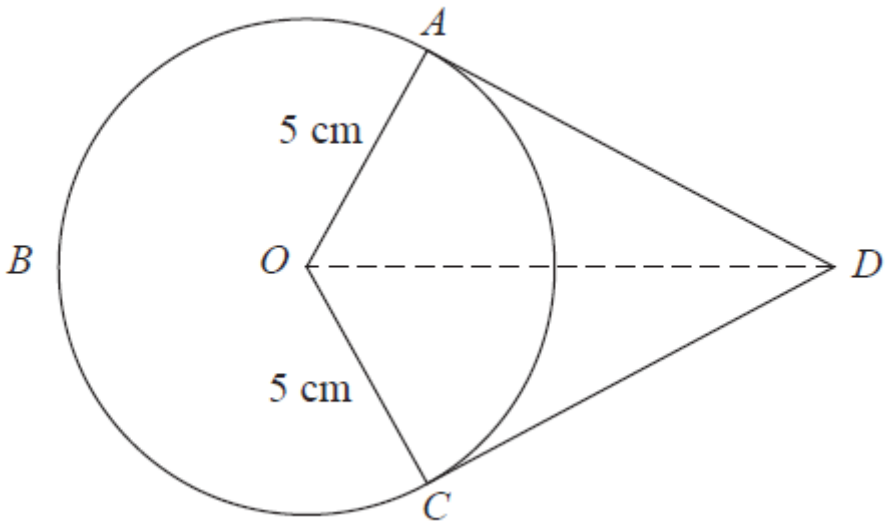
Diagram **NOT** accurately drawn

P, *Q* and *T* are points on the circumference of a circle, centre *O*.
The line *ATB* is the tangent at *T* to the circle.
PQ = *TQ*.
Angle *ATP* = 58°.
Calculate the size of angle *OTQ*.
Give a reason for each stage in your working.

.....

(4 marks)

28.



A, *B* and *C* are points on a circle of radius 5 cm, centre *O*.

DA and *DC* are tangents to the circle.

DO = 9 cm

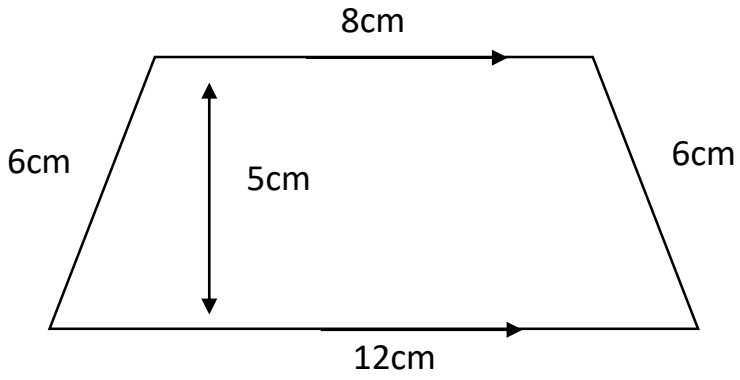
Work out the length of arc *ABC*.

Give your answer correct to 3 significant figures.

.....

(5 marks)

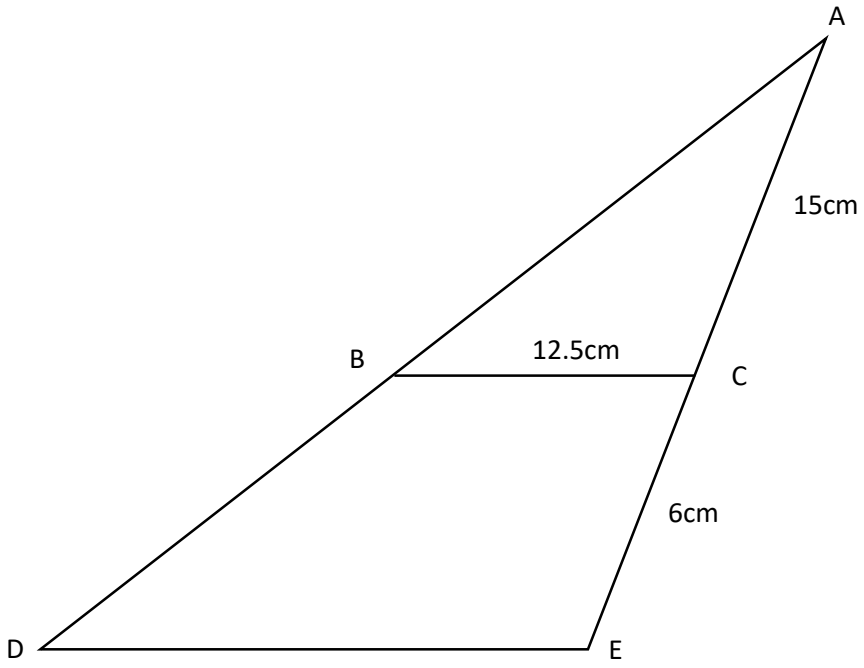
29. Work out the area of the trapezium.



.....

(2 marks)

30.



Triangles ABC and ADE are mathematically similar.

BC = 12.5cm

AC = 15cm

CE = 6cm

Calculate the length DE.

.....

(2 marks)

31.

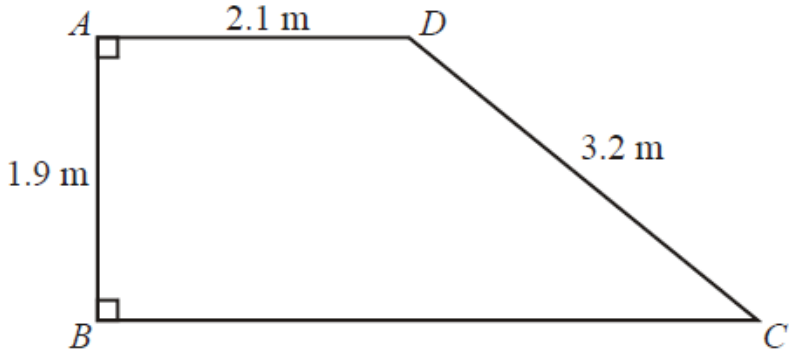


Diagram **NOT** accurately drawn

ABCD is a trapezium.

AD is parallel to *BC*.

Angle *A* = angle *B* = 90°.

AD = 2.1 m

AB = 1.9 m

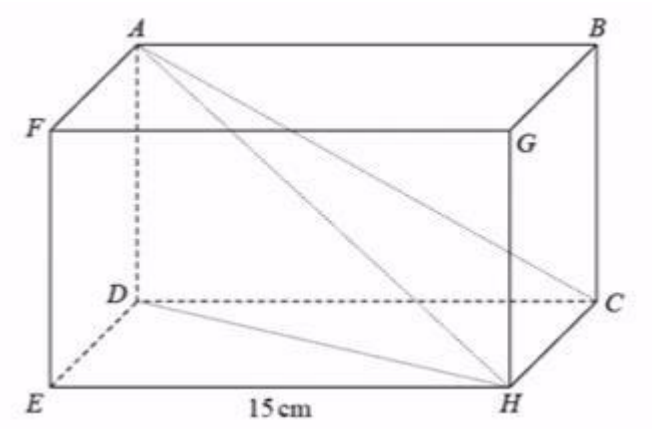
CD = 3.2 m.

Work out the length of *BC*. Give your answer correct to 3 significant figures.

.....

(3 marks)

32. ABCDEFGH is a cuboid.



Angle EDH = 64°

Angle ACD = 28°

EH = 15cm

Work out the size of angle AHD.

Give your answer correct to 1 decimal place.

.....

(5 marks)

33. $a = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ and $b = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$

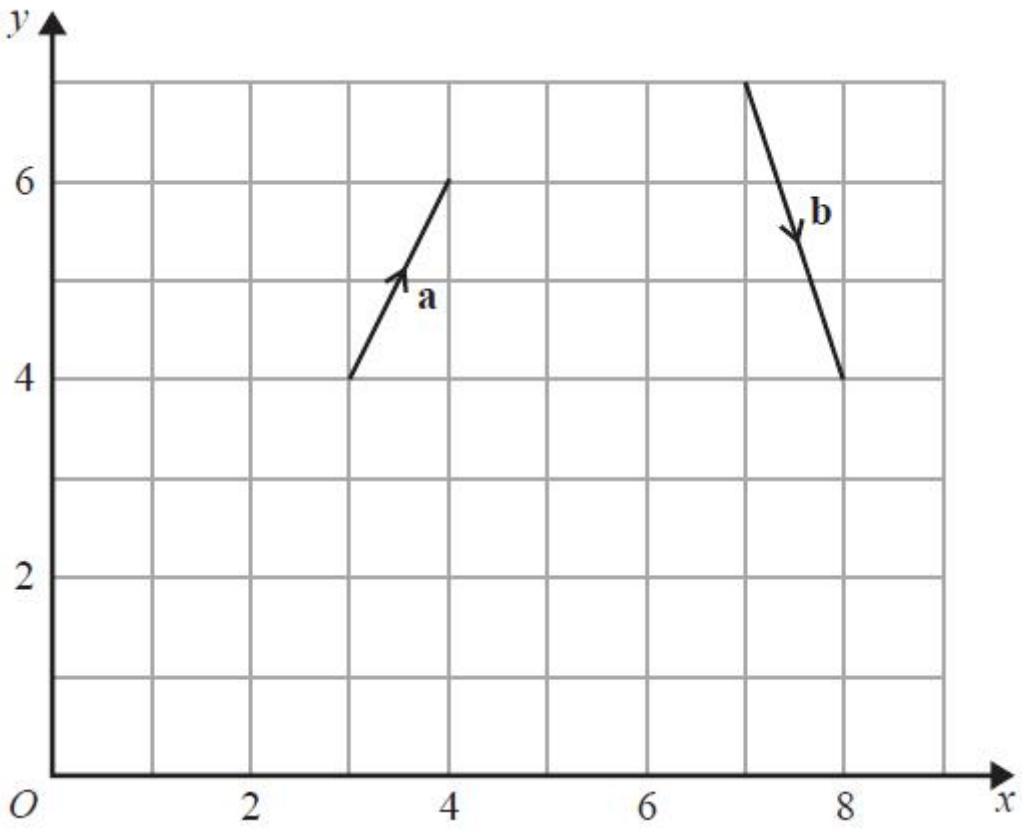
Write down $2a - b$ as a column vector.

.....

(2 marks)

---

34. The vector **a** and the vector **b** are shown on the grid.



(a) On the grid, draw and label vector –2**a**

(1 mark)

(b) Work out **a** + 2**b** as a column vector.

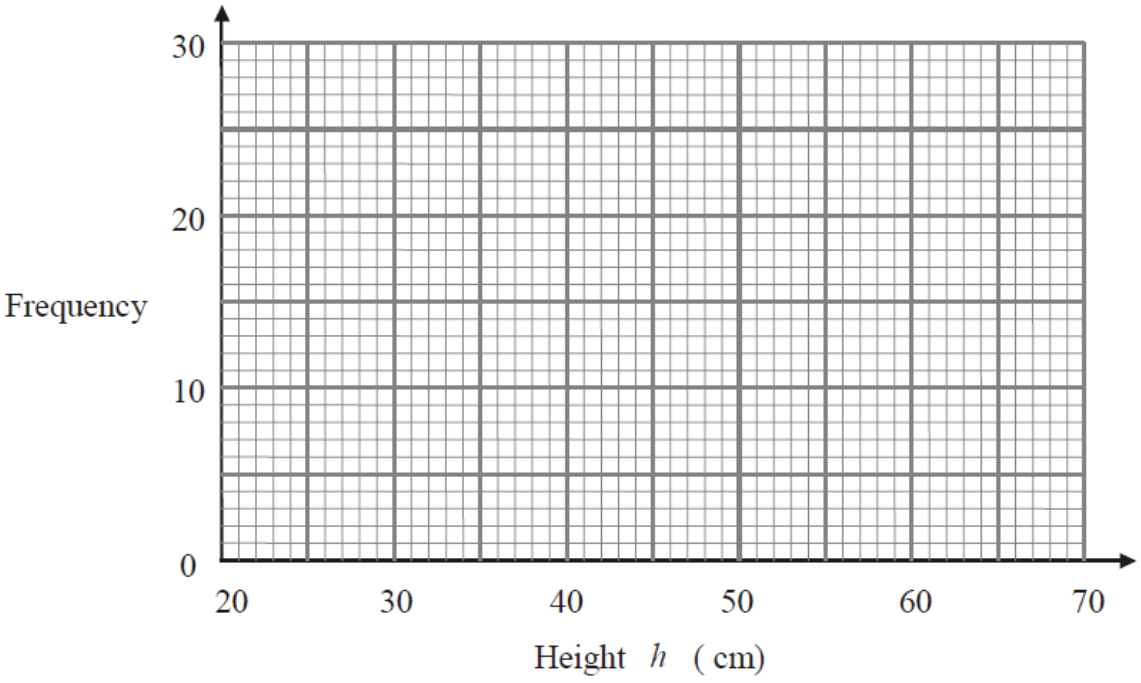
.....

(2 marks)

35. The table shows some information about the height of 60 plants.

Height (h cm)	Frequency
$20 < h \leq 30$	8
$30 < h \leq 40$	13
$40 < h \leq 50$	25
$50 < h \leq 60$	10
$60 < h \leq 70$	4

Draw a frequency polygon to show this information.

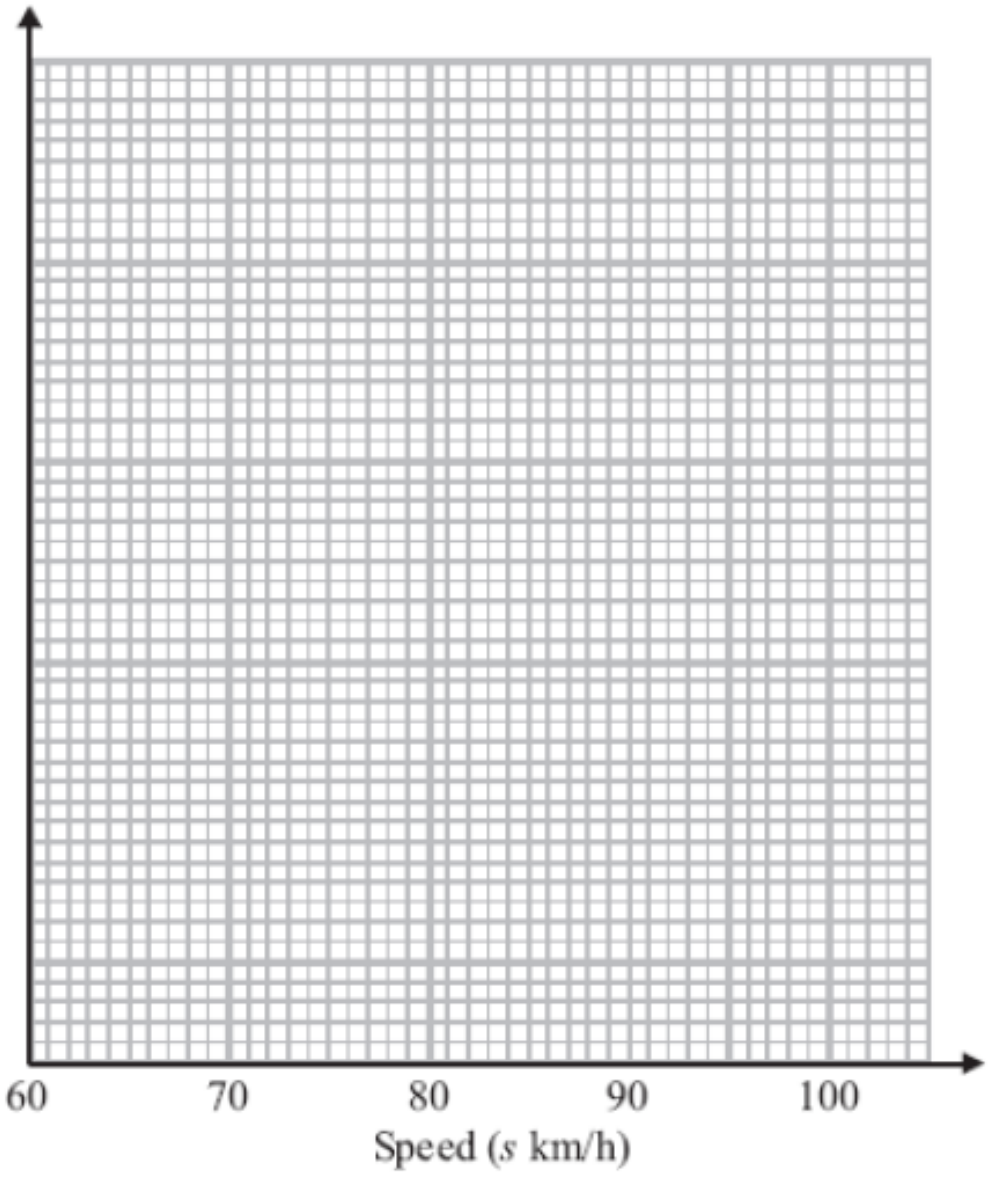


(3 marks)

36. The table gives some information about the speeds, in km/h, of 100 cars.

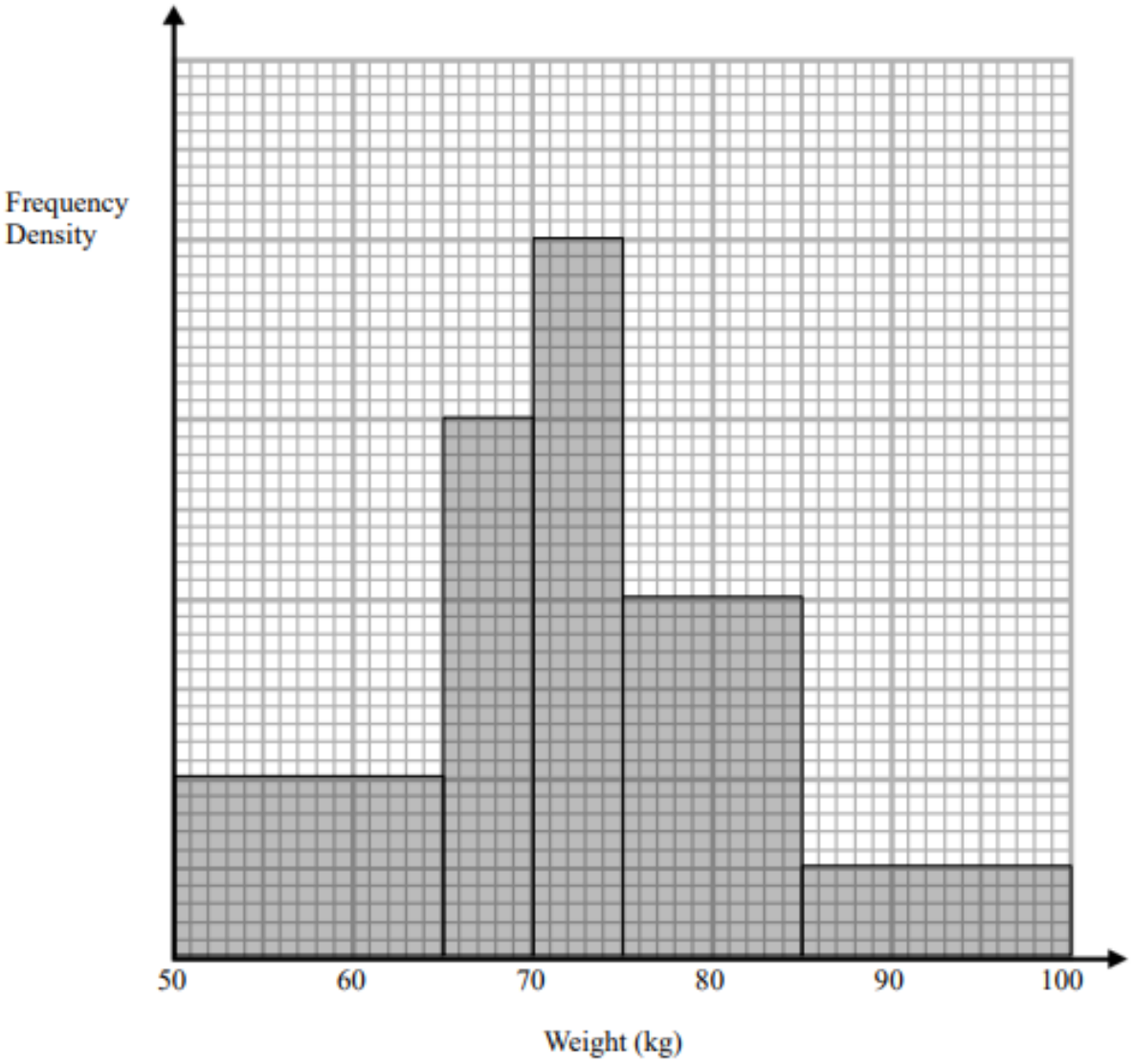
Speed(s km/h)	Frequency
$60 < s \leq 65$	15
$65 < s \leq 70$	25
$70 < s \leq 80$	36
$80 < s \leq 100$	24

On the grid, draw a histogram for the information in the table.



(3 marks)

37. The histogram shows the information about the weight of some animals.



30 animals weigh between 50kg and 65kg

Work out an estimate for the number of animals which weigh more than 80kg

.....

(3 marks)

38. James has a bag of counters.

In the bag there are 5 red counters and 3 blue counters.

James takes at random a counter from the bag and notes its colour.

He does not put the counter back in the bag.

He then takes at random a second counter.

Work out the probability that James takes two different coloured counters.

.....

(4 marks)

39. There are some green counters and some blue counters in a bag.

The ratio of green to blue is 4:1

One counter is removed, not replaced and a second counter is taken.

The probability that they are both green is $\frac{22}{35}$

How many counters were in the bag before any were removed?

.....

(5 marks)

End of Paper