

GCSE PAPER 3 QUESTIONS FOR EDEXCEL

Questions 1 to 15 could appear on Foundation OR Higher tier papers.
Questions 16 to 32 would be higher tier questions only.

Question 1

Frank travels from the UK to India every year.

In 2012, the exchange rate was £1 = 67.1 rupees.

In 2016, the exchange rate was £1 = 82.3 rupees.

In 2012 Eric changed £900 into rupees.

How many pounds (£) did Eric have to change to rupees in 2016 to get the same number of rupees as he did in 2012?

Question 2

Here are the ingredients needed to make 6 shortbread biscuits.

Shortbread biscuits makes 6 biscuits 90 g butter 45 g caster sugar 135 g flour
--

Bill is going to make some shortbread biscuits.

He has the following ingredients

300 g butter 180 g caster sugar 400 g flour

Work out the greatest number of shortbread biscuits that Tariq can make with his ingredients. You must show all your working.

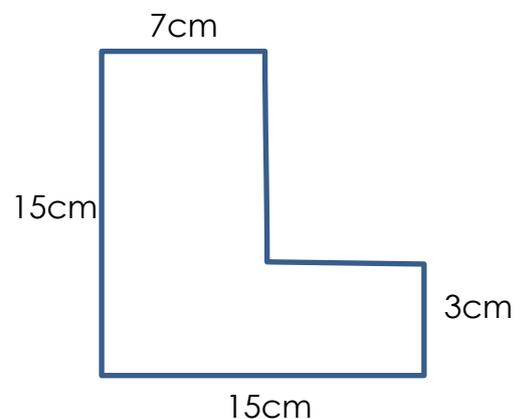
Question 3

The diagram shows the cross-section of a solid prism.
The length of the prism is 1.4 m.

The prism is made from metal.

The density of the metal is 9 grams per cm^3 .

Work out the mass of the prism.



Question 4

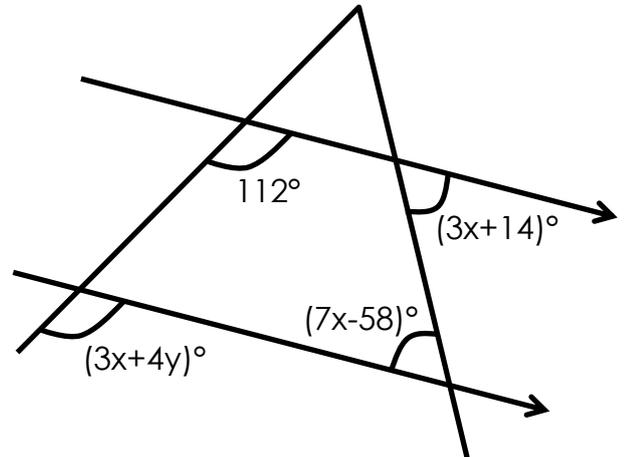
A town has three car parks.
 Castle car park has x spaces.
 West car park has 62 more spaces than Castle car park.
 East car park has five times as many spaces as Castle car park.
 The total number of spaces in Castle car park and East car park is more than four times the number of spaces in West car park.
 Work out the least possible number of spaces in Castle car park.

Question 5

This diagram is not drawn accurately.

Find the value of y .

Show all your working and give geometrical reasons.



Question 6

A school recorded the number of students late on each day for 21 days.
 The stem and leaf diagram shows this information.

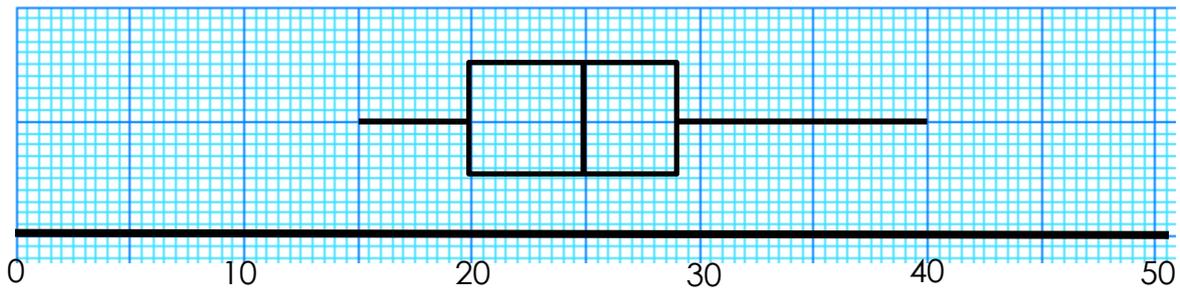
Number of students late

1	4 5 7 8 8 9
2	2 2 5 6 6 7 7 9 9 9
3	0 1 3 4 6

Key: 1 4 means 14 students late

- (a) Find the median number of pupils late for school.
- (b) Find the inter-quartile range for the number of pupils late for school.

Another school in the same city also recorded data for lateness. This data is displayed in the box and whisker diagram below.



- (c) Compare and contrast the two schools lateness.

Question 7

Solve $5x + 3y = 14$
 $3x - 4y = 20$

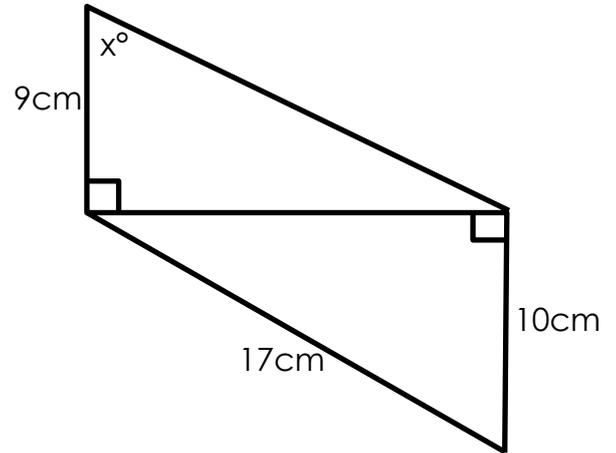
Question 8

Make r the subject in the formula

$$m = \sqrt{3r^2 + n}$$

Question 9

Find the size of angle x .
Give your answer correct to 2 decimal places.



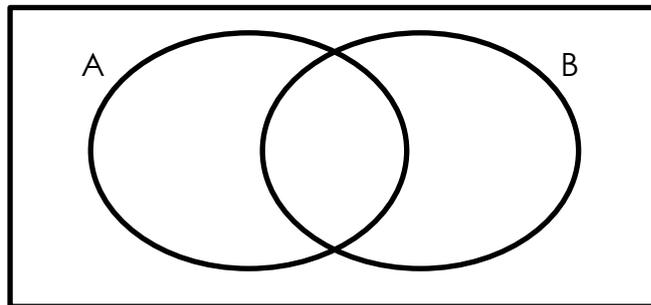
Question 10

$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16\}$

Event A = Number is prime

Event B = Number is a factor of 36

(a) Complete the Venn Diagram



(b) Write down

(i) $P(A \cap B)$

(ii) $P(A \cup B)$

Question 11

Change $23m^3$ into mm^3

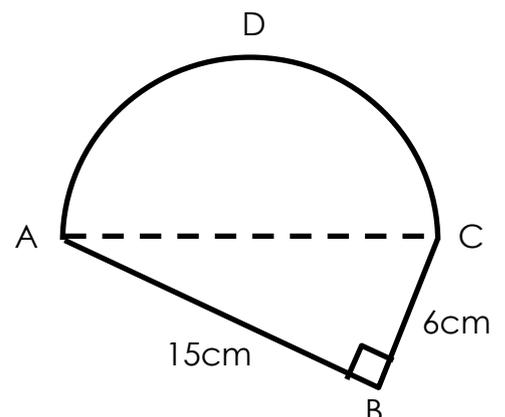
Question 12

Pete bought a motorbike 2 years ago. The motorbike depreciated in value by 11% per year. He sold it for £6495. How much did he buy it for originally?

Question 13

The diagram shows a compound shape made up of a semicircle ADC with diameter AC and a right angled triangle ABC.

Find the area of the compound shape.



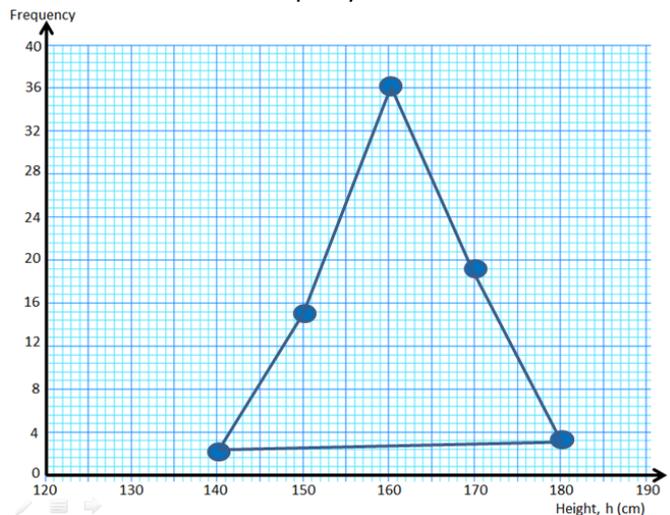
Question 14

The heights of a number of women were measured. The results are shown in the table below:

Height, h (cm)	Female Frequency
$130 < h \leq 140$	2
$140 < h \leq 150$	15
$150 < h \leq 160$	36
$160 < h \leq 170$	19
$170 < h \leq 180$	3

- (a) In which group will the median height lie?
(b) Estimate the mean height of the women in the survey.

A frequency polygon was drawn to display this data, which is shown below:



- (c) Write down two things that are incorrect about this diagram.

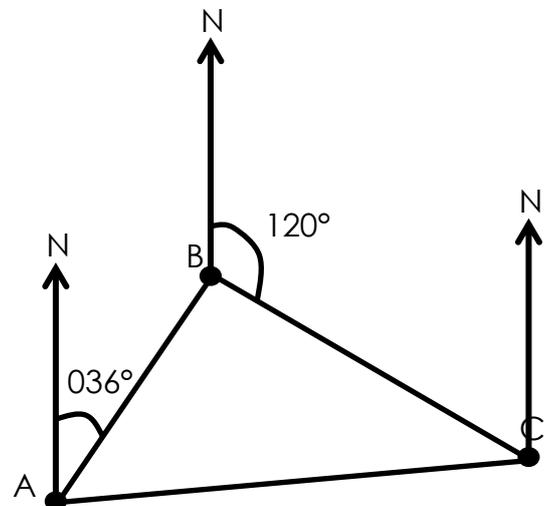
Question 15

The diagram shows Ian's travels from his home, at A town C via town B.

He leaves A on a bearing of 036° till he gets to B.

He then changes direction and travels on a bearing of 120° to point C.

If the bearing of point C from point A is 073° , what bearing will have to travel on if he goes back to point A direct from point C?



Question 16

60 students are choosing their A levels.

29 chose Geography.

33 chose History

25 chose Computer Science.

18 chose History and Geography.

11 chose History and Computer Science.

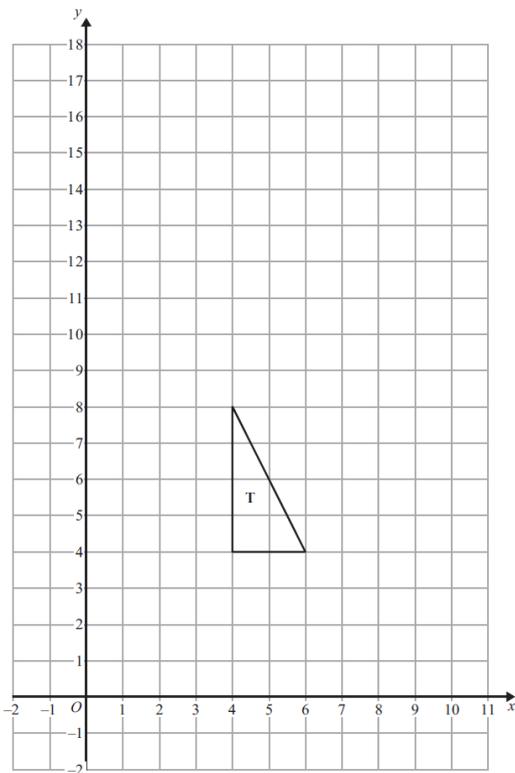
9 chose Geography and Computer Science.

6 chose Geography, History and Computer Science.

(a) Represent this information in a Venn Diagram.

(b) What is the probability that a student, chosen at random, chooses exactly one of History, Geography and Computer Science as an option.

Question 17



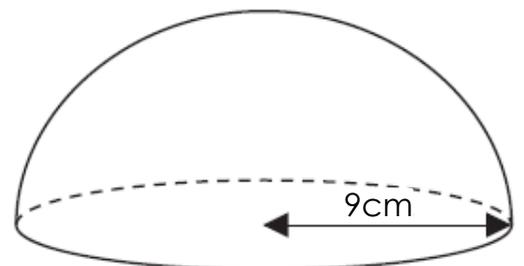
Enlarge triangle T by a scale factor $-1\frac{1}{2}$ from the centre $(6, 9)$

Question 18

The diagram shows a solid hemisphere of radius 9 cm.

The curved surface area of a sphere = $4\pi r^2$

Find the **total** surface area of the solid hemisphere.



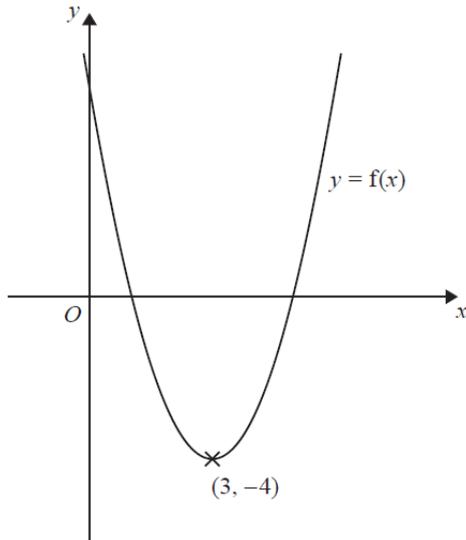
Question 19

Zoe is investing £4000 in a bank. The bank pays 2% interest during the first year. It then pays $x\%$ compound interest for the next two years. After 3 years, Zoe has not withdrawn or added any funds herself and has £4195.04 in her account at the end of the third year. What is the value of x ?

Question 20

Triangle ABC has length AC = 9cm, length BC 12cm and angle ABC = 34°.

- (a) Given that angle BAC is acute, find the size of angle BAC.
 (b) If you were not told that angle BAC was acute, what effect would this have on your answer?

Question 21

The diagram shows part of the curve with equation $y = f(x)$.

The coordinates of the minimum point of this curve are $(3, -4)$.

- (a) Write down the equation of this curve in the form $y = x^2 + ax + b$

Write down the coordinates of the minimum point after the following transformations...

- (b) $y = f(x - 2)$
 (c) $y = f(x) - 3$
 (d) $y = 3f(-x)$

Question 22

Liquid A has a density of 1.1 g/cm³.

Liquid B has a density of 2.3 g/cm³.

130 g of liquid A and 152 g of liquid B are mixed to make liquid C.

Work out the density of liquid C.

Question 23

f is the function $f(x) = 6x - 5$

- (a) Find $f(6)$.
 (b) Express the inverse function f^{-1} in the form $f^{-1}(x) =$

g is the function $g(x) = x^2 - 31$

- (c) Find $g(-5)$.
 (d) (i) Find $gf(x)$. Give your answer in the form $gf(x) = ax^2 + bx + c$
 (ii) Solve $gf(x) = 0$, giving your answers correct to 2 decimal places.

Question 24

James monitors the fish population in the local lake. He catches 50 fish and tags them.

A few days later he catches 40 fish. He discovers that 5 had tags.

Estimate the fish population of the lake.

Question 25

(a) Show that the function $f(x) = x^3 - 9x + 2$ has a root between $x = 2$ and $x = 3$.

(b) Show that $x^3 - 9x + 2 = 0$ can be rearranged into the form

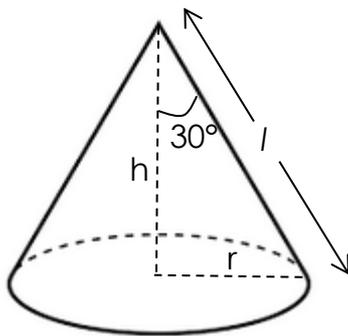
$$x = \sqrt{9 - \frac{2}{x}}$$

(c) Using the iterative formula

$$x_{n+1} = \sqrt{9 - \frac{2}{x_n}}$$

with $x_0 = 2.5$, find x_1 and x_2 giving both answers correct to 5 decimal places.

Question 26



The total surface area of this solid cone is $90\pi \text{ cm}^3$.

Find the volume of the cone, giving your answer correct to 3 decimal places.

Curved Surface Area of a cone = $\pi r l$
Volume of a cone = $\frac{1}{3}\pi r^2 h$

Question 27

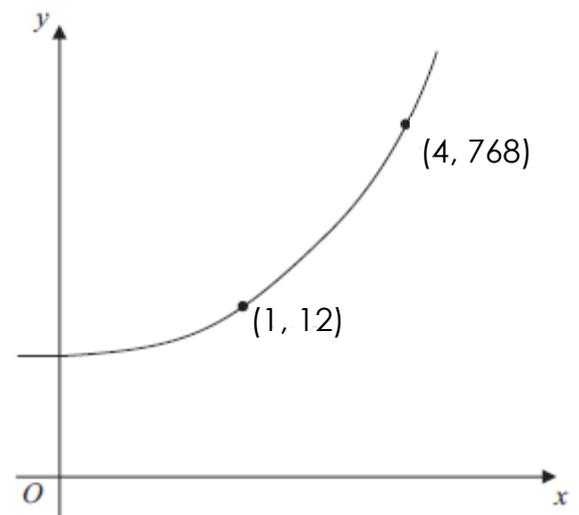
The sketch shows a curve with equation

$$y = ka^x$$

where k and a are constants, and $a > 0$

The curve passes through the points $(1, 12)$ and $(4, 768)$.

Calculate the value of k and the value of a .



Question 28

Anna is doing an experiment to estimate the value of π .

She uses the formula $\pi = \frac{C}{D}$ where C is the circumference and D is the diameter.

He measures a cylinder which has a circumference of 150mm, measured to the nearest mm and a diameter of 47mm, measured to the nearest mm.

Work out the bounds of accuracy of π using these measurements.

Question 29

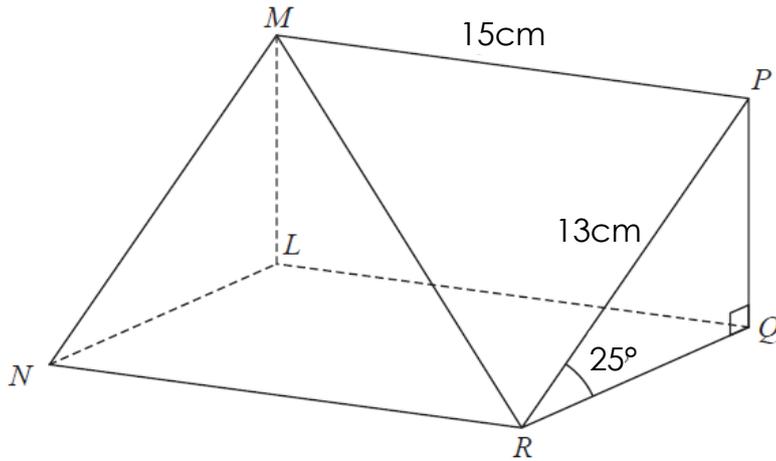
Solve the equation $\frac{3(3x-1)^2}{2x-5} = 5x - 3$, giving your answers correct to 2 decimal places.

Question 30

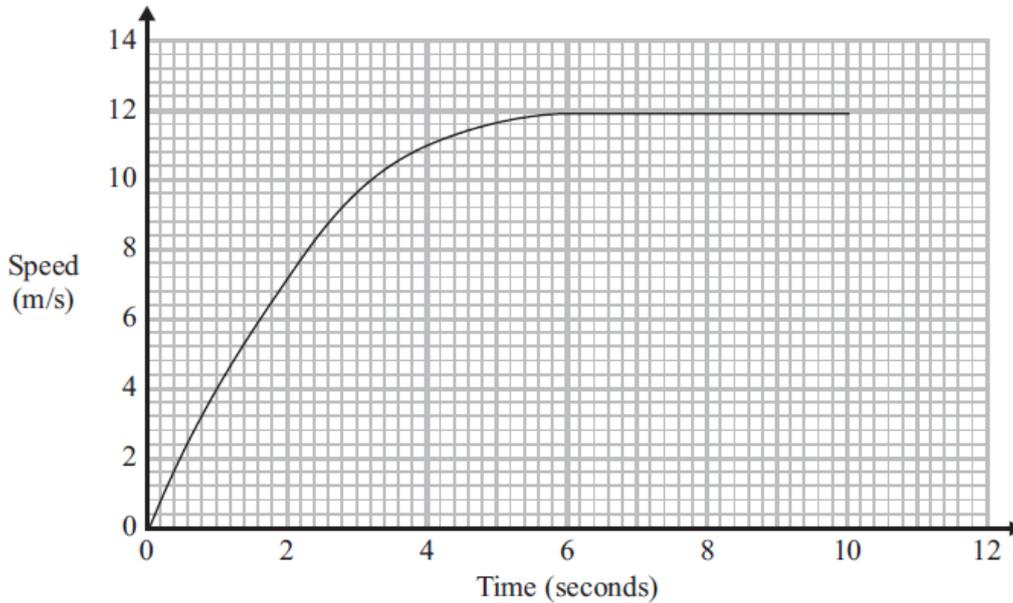
Solve the inequality $x(x - 3) > 28$

Question 31

The diagram shows a prism. $MP = 15\text{cm}$, $PR = 13\text{cm}$ and angle $PRQ = 25^\circ$. Find the angle that the line MR makes with the plane $LQRN$.



Question 32



An athlete is running a race. The diagram shows a speed-time graph for this race.

- (a) Estimate the athlete's acceleration 2 seconds into the race.
- (b) Estimate the distance travelled over the 10 second duration of the race.