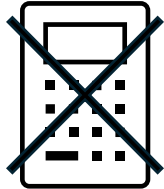


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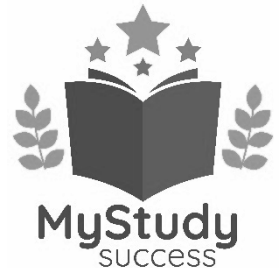
Forename(s):

GCSE Mathematics – Higher Tier

Paper 1 – Non Calculator



Practice Set C



Materials

- **Formulae Sheet** (on the next page)
- **Black** ink or ball-point pen
- Pencil
- Eraser
- Protractor
- Compass
- Tracing Paper
- **No calculator allowed**

/40

Instructions

- Time allowed: **45 minutes**.
- The total mark for this paper is **40**.
- Show **all** of your working.
- Draw diagrams in pencil.
- Plot graphs in pencil.
- Diagrams are **not** accurately drawn, unless otherwise indicated.
- Cross through any work you don't want to be marked

Higher Tier Formulae Sheet

Perimeter, Area and Volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

Area of a trapezium = $\frac{1}{2}(a + b)h$

Volume of a prism = area of cross section $\times$ length

Where r is the radius and d is the diameter:

Circumference of a circle = $2\pi r = \pi d$

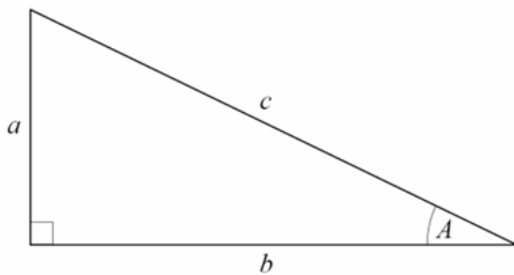
Area of a circle = πr^2

Quadratic Formula

The solution of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

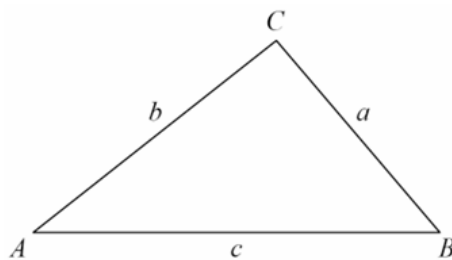


In any right-angled triangle where a , b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$



In any triangle ABC where a , b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area of triangle} = \frac{1}{2}ab \sin C$$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Probability

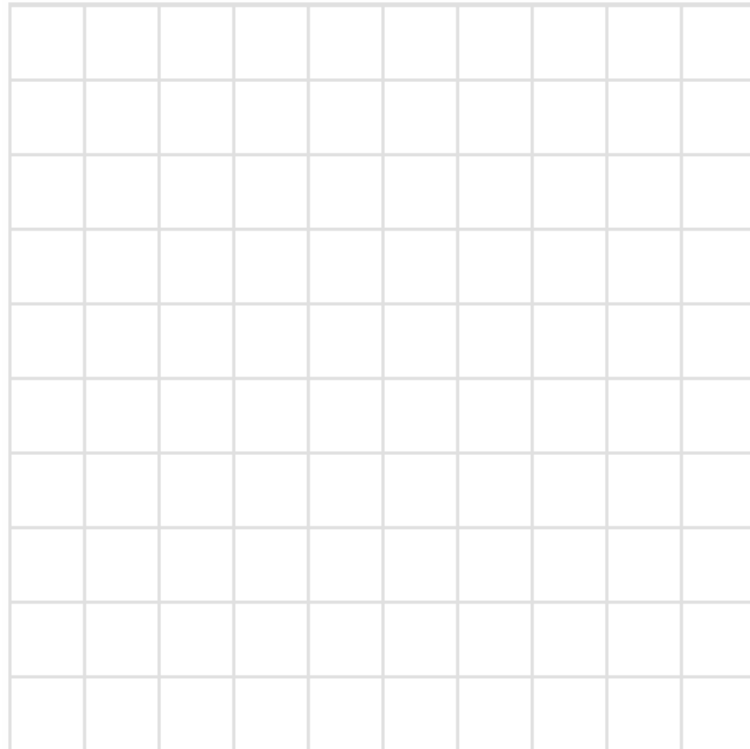
Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B)P(B)$$

1 $v = \begin{pmatrix} -6 \\ 5 \end{pmatrix}$

On the grid below, draw the vector v .



(Total for question 1 is 1 mark)

- 2 The mean weight of a group of 5 people is 80kg.
Another person who weighs 50kg joins the group.
Work out the mean weight of the group of 6 people.

_____kg

(Total for question 2 is 3 marks)

-
- 3 Write down the exact value of $\cos 60^\circ + \sin 30^\circ$

(Total for question 3 is 2 marks)

4 (a) Work out an estimate for the value of $\sqrt{63.7 \times 24.8}$

(2)

(b) $(2.3)^8 = 783$ correct to 3 significant figures.

Find the value of $(23)^8$ correct to 3 significant figures.

Give your answer in standard form.

(2)

(b) Work out the value of $\left(\frac{125}{27}\right)^{-\frac{1}{3}}$

(2)

(Total for question 4 is 6 marks)

- 5 Two families go to the theatre to watch a show.

The Lincoln family consists of 2 adults and 4 children.

The Graham family consists of 3 adults and 5 children.

The cost of the tickets for the Lincoln family came to a total of £28

The cost of the tickets for the Graham family came to a total of £39

Work out the cost of one child ticket and one adult ticket.

Child ticket = _____

Adult ticket = _____

(Total for question 5 is 4 marks)

6 Here are two mathematically similar rings.



radius of the smaller ring : radius of the larger ring = 1 : 3

The volume of the larger ring is 108cm^3

Work out the volume of the smaller ring.

_____ cm^3

(Total for question 6 is 3 marks)

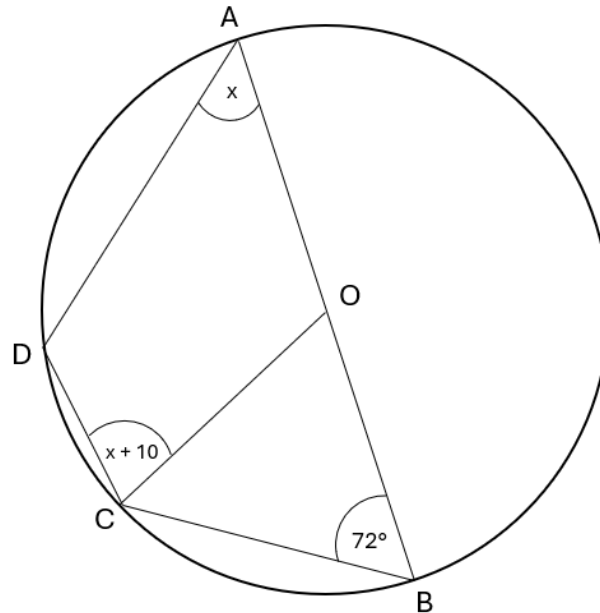
7 Prove that $0.\dot{3} = \frac{1}{3}$

(Total for question 7 is 3 marks)

8 Show that $\frac{4 - \sqrt{12}}{\sqrt{3} - 1}$ can be written in the form $\sqrt{3} + k$ where k is an integer

(Total for question 8 is 3 marks)

- 9 The diagram shows the circle with centre O.
The straight line AB is the diameter of the circle.
A, B, C and D are all points on the circumference of the circle.



Work out the value of x

State any angle rules or circle theorems that you use.

$x =$ _____

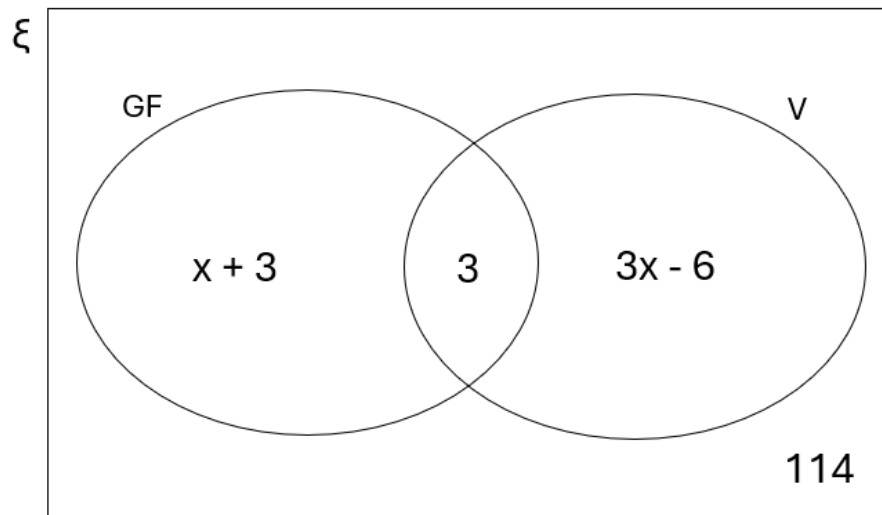
(Total for question 9 is 3 marks)

10 The venn diagram shows information about people's dietary requirements in a restaurant.

ξ = 150 people in the restaurant

GF = Gluten free

V = Vegetarian

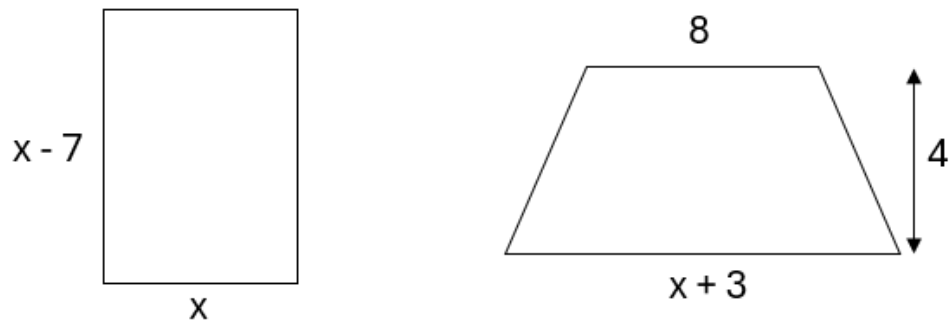


A person is chosen at random.

What is the probability that this person is vegetarian.

(Total for question 10 is 4 marks)

11 The diagram shows a rectangle and a trapezium



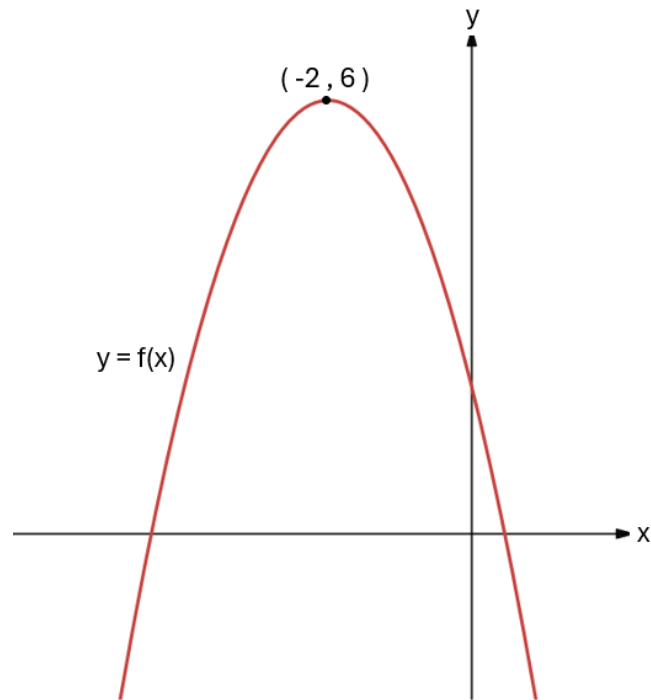
All measurements are in centimetres.

The area of the rectangle is smaller than the area of the trapezium.

Find the possible range of the values of x .

(Total for question 11 is 5 marks)

12 Here is the graph of $y = f(x)$



The coordinates of the turning point of this curve are $(-2, 6)$

Write down the turning point of the curve with equation

(a) $y = 2f(x)$

(_____ , _____)

(1)

(b) $y = f(x + 2) - 1$

(_____ , _____)

(2)

(Total for question 12 is 3 marks)

END OF TEST

TOTAL FOR THIS PAPER IS 40 MARKS