



Cambridge IGCSE™

CANDIDATE
NAME

CENTRE
NUMBER

--	--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--

MATHEMATICS

0580/32

Paper 3 (Core)

February/March 2020

2 hours

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π , use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages. Blank pages are indicated.

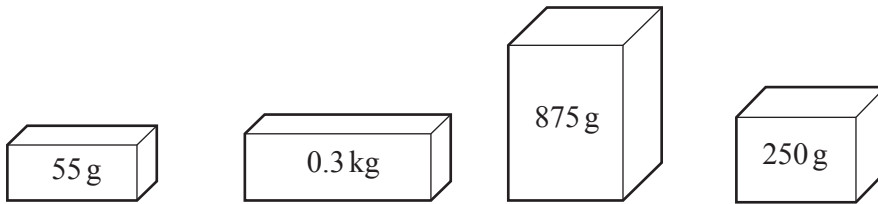


1 Navja works in a post office.

- (a) The table shows the costs of sending parcels by post. The cost depends on the mass, m grams, of the parcel.

Type of parcel	Mass (g)	Cost (\$)
Small	$0 < m \leq 60$	0.76
Medium	$60 < m \leq 100$	0.95
Large	$100 < m \leq 250$	2.20
Extra large	$250 < m \leq 1000$	5.60

- (i) Sai sends each of these four parcels by post.



He pays with a \$20 note.

Work out how much change he receives.

\$ [4]

- (ii) On 1 April, the cost of sending any parcel increases by 5%.

- (a) Show that the increase in the cost of sending an **Extra large** parcel is \$0.28 .

[1]

- (b) Avani says

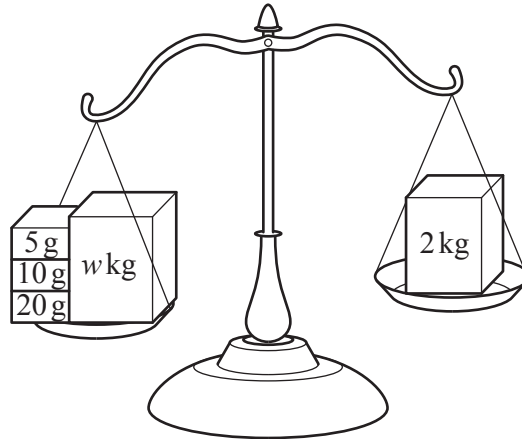
“As the cost of an **Extra large** parcel increases by \$0.28 then the cost of a **Large** parcel will also increase by \$0.28 to \$2.48.”

Explain why Avani is incorrect.

.....

..... [1]

- (b) (i) Navja weighs a parcel with mass w kg on her scales. She uses the masses shown to balance the scales.



Work out the value of w .

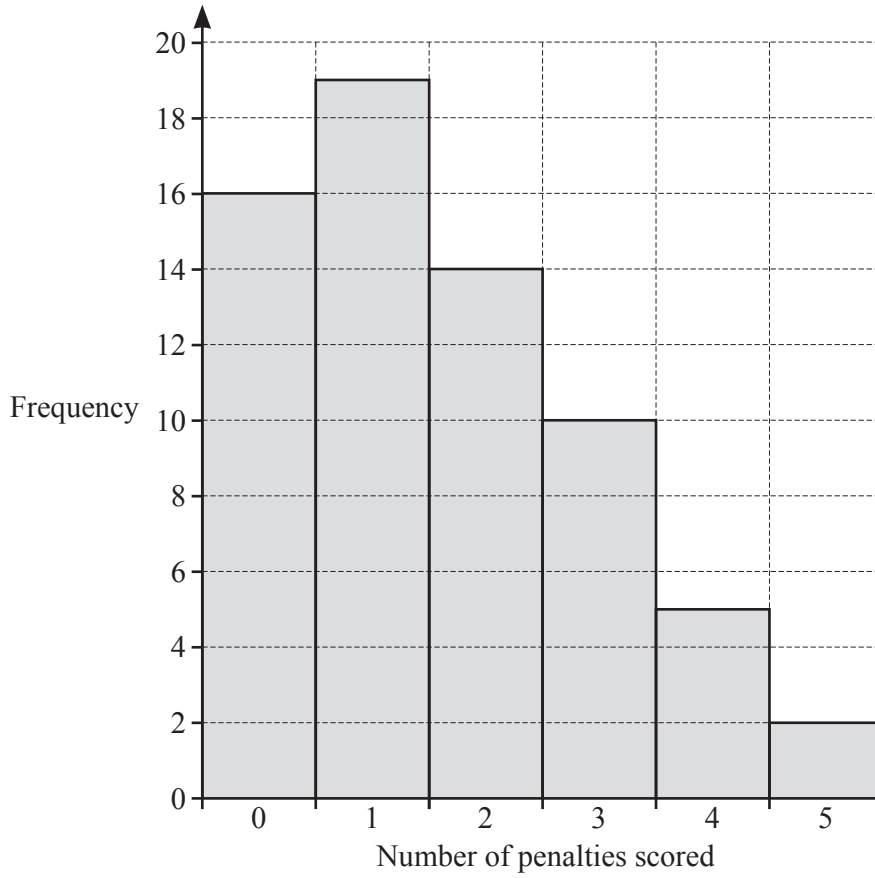
$$w = \dots\dots\dots [3]$$

- (ii) Sometimes Navja uses an electronic weighing machine. The machine gives the mass, p kg, of a parcel as 12.4 kg, correct to the nearest 100 g.

Complete this statement about the value of p .

$$\dots\dots\dots \leq p < \dots\dots\dots [2]$$

- 2 (a) 66 football players each take five penalties.
The number of penalties that each player scores is recorded.
The results are shown in the bar chart.



(i) Write down the mode.

..... [1]

(ii) Write down the range.

..... [1]

(iii) Calculate the mean.

..... [3]

(b) The attendance at a football match is 11 678.

(i) Write 11 678 in words.

..... [1]

(ii) Write 11 678 correct to the nearest 100.

..... [1]

(c) In a football stadium there are 15 000 seats.
10 650 of these seats are occupied.

Find the percentage of the 15 000 seats that are occupied.

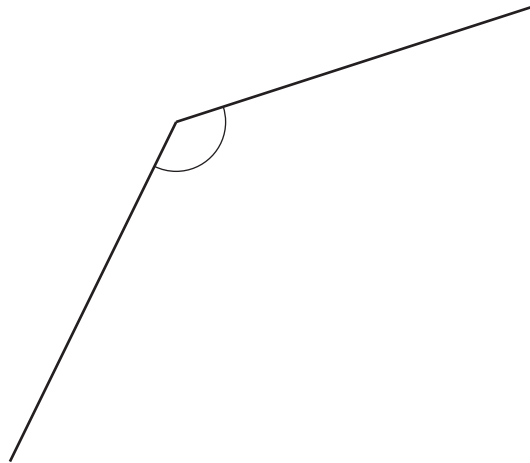
..... % [1]

(d) A ticket to a football match costs \$20.

Calculate the cost of the ticket in rupees when the exchange rate is 1 rupee = \$0.016 .

..... rupees [2]

3 (a)



(i) Write down the mathematical name for this type of angle.

..... [1]

(ii) Measure this angle.

..... [1]

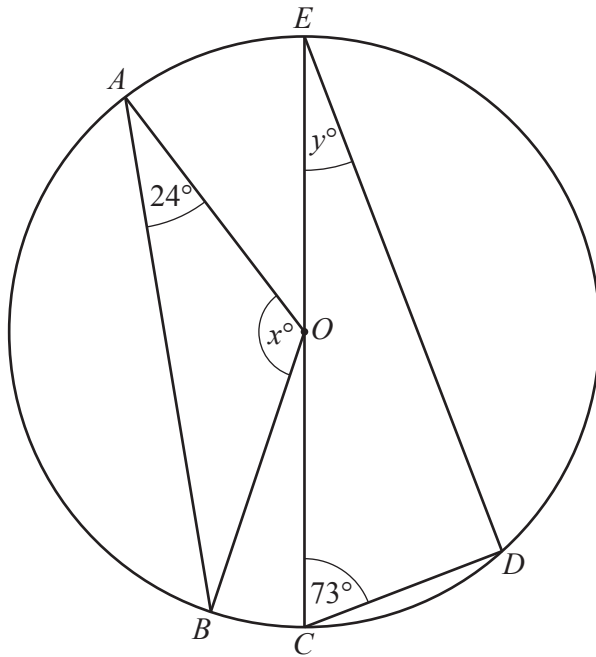
(b) (i) Write down the mathematical name for an 8-sided polygon.

..... [1]

(ii) Work out the size of an interior angle of a regular 24-sided polygon.

..... [2]

(c)



NOT TO SCALE

The diagram shows a circle, centre O , with diameter CE . A, B, C, D and E lie on the circumference of the circle.

- (i) Find the value of x .
Give a reason for your answer.

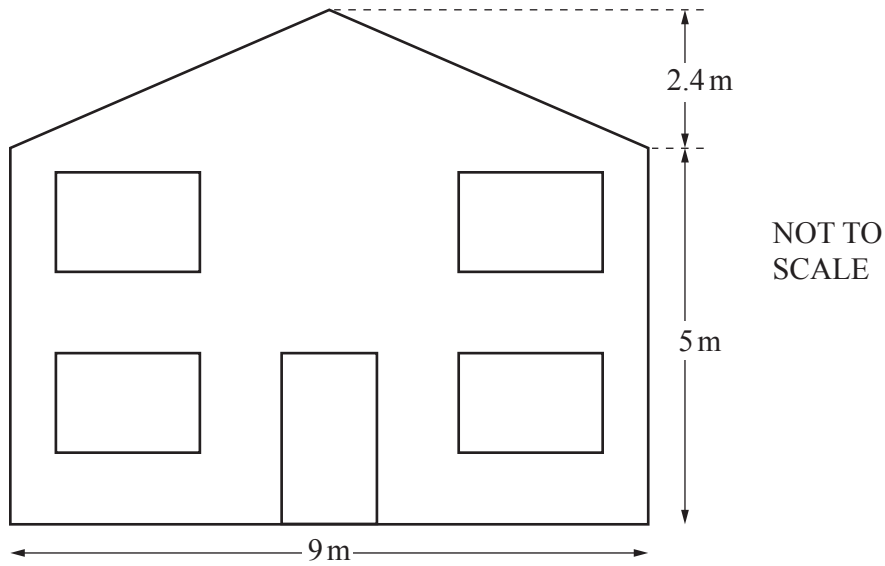
$x = \dots\dots\dots$ because $\dots\dots\dots$ [3]

- (ii) Find the value of y .
Give a reason for your answer.

$y = \dots\dots\dots$ because $\dots\dots\dots$ [2]

- (iii) Draw a tangent to the circle at A . [1]

4 (a)



The diagram shows the front of Pranav’s house.

(i) Work out the total area of the front of his house.

..... m² [3]

(ii) The door is 0.9 m wide and 2.1 m high.
Each of the four windows are 1.5 m wide and 1.2 m high.

Work out the total area of the door and the four windows.

..... m² [3]

(iii) Pranav paints the front of his house but not the door and not the four windows.

Work out the area he paints.

..... m² [1]

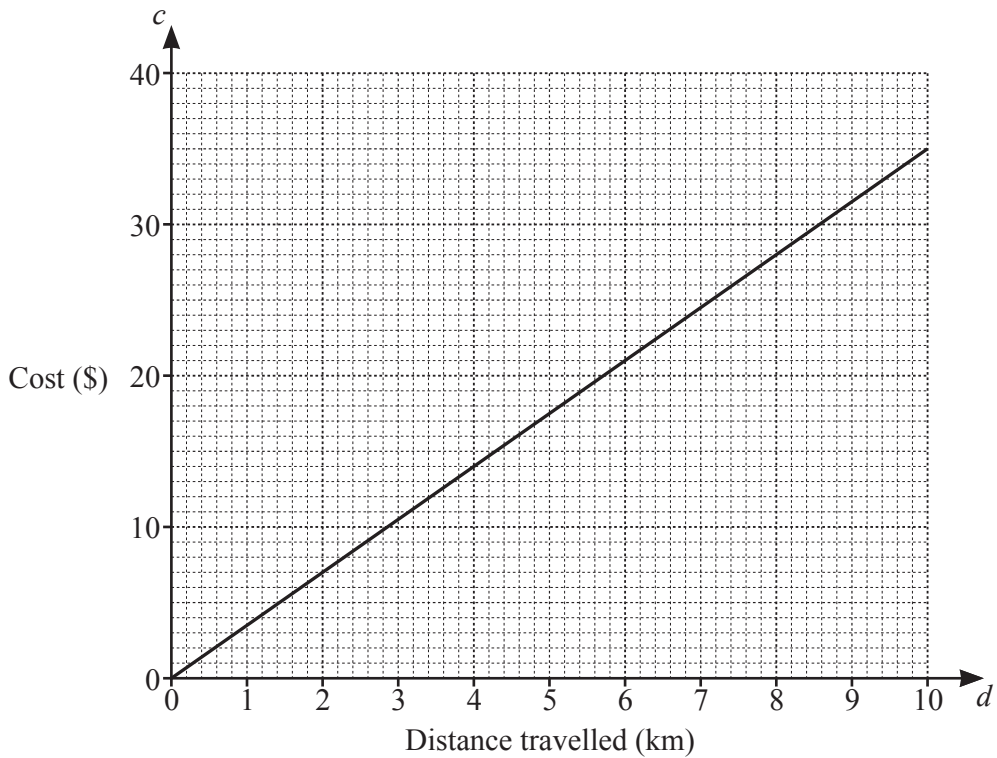
9

- (b) Pranav paints a wall of area 53 m^2 .
One litre of paint covers an area of 4.5 m^2 .
Paint is sold in 2.5 litre tins, each costing \$24.75 .
Pranav buys the least number of tins to paint this wall.

Work out the cost of the paint.

\$ [4]

5 (a)



(i) The graph shows the cost, $\$c$, of travelling a distance, d km, with *Saanvi's Taxis*.

(a) Write down the cost of a 4 km journey.

$\$$ [1]

(b) Complete this statement.

Saanvi's Taxis cost $\$$ for each kilometre travelled. [1]

(c) Find the equation of the line.

$c =$ [1]

(ii) *Krishna's Taxis* cost $\$5$ to hire plus $\$2$ for each kilometre travelled.

(a) Show that the cost of a 4 km journey with *Krishna's Taxis* is $\$13$.

[1]

(b) Find an equation for the cost, $\$c$, of travelling d kilometres with *Krishna's Taxis*.

$c =$ [2]

(c) On the grid, draw a line to show the cost of travelling with *Krishna's Taxis*.

[2]

- (d) Mrs Singh wants to hire a taxi.
She says that *Saanvi's Taxis* are always cheaper than *Krishna's Taxis*.

Is Mrs Singh correct?
Give a reason for your answer. Use your graph to help you.

..... because
..... [1]

- (b) A minibus can be hired from *Dhruv's Minibuses*.
The cost is \$ h per hour plus \$ p per passenger.

- (i) When the minibus is hired for 3 hours with 10 passengers the cost is \$61.

Complete the equation.

$$3h + 10p = \dots\dots\dots [1]$$

- (ii) When the minibus is hired for 5 hours with 8 passengers the cost is \$80.

Write this information as an equation.

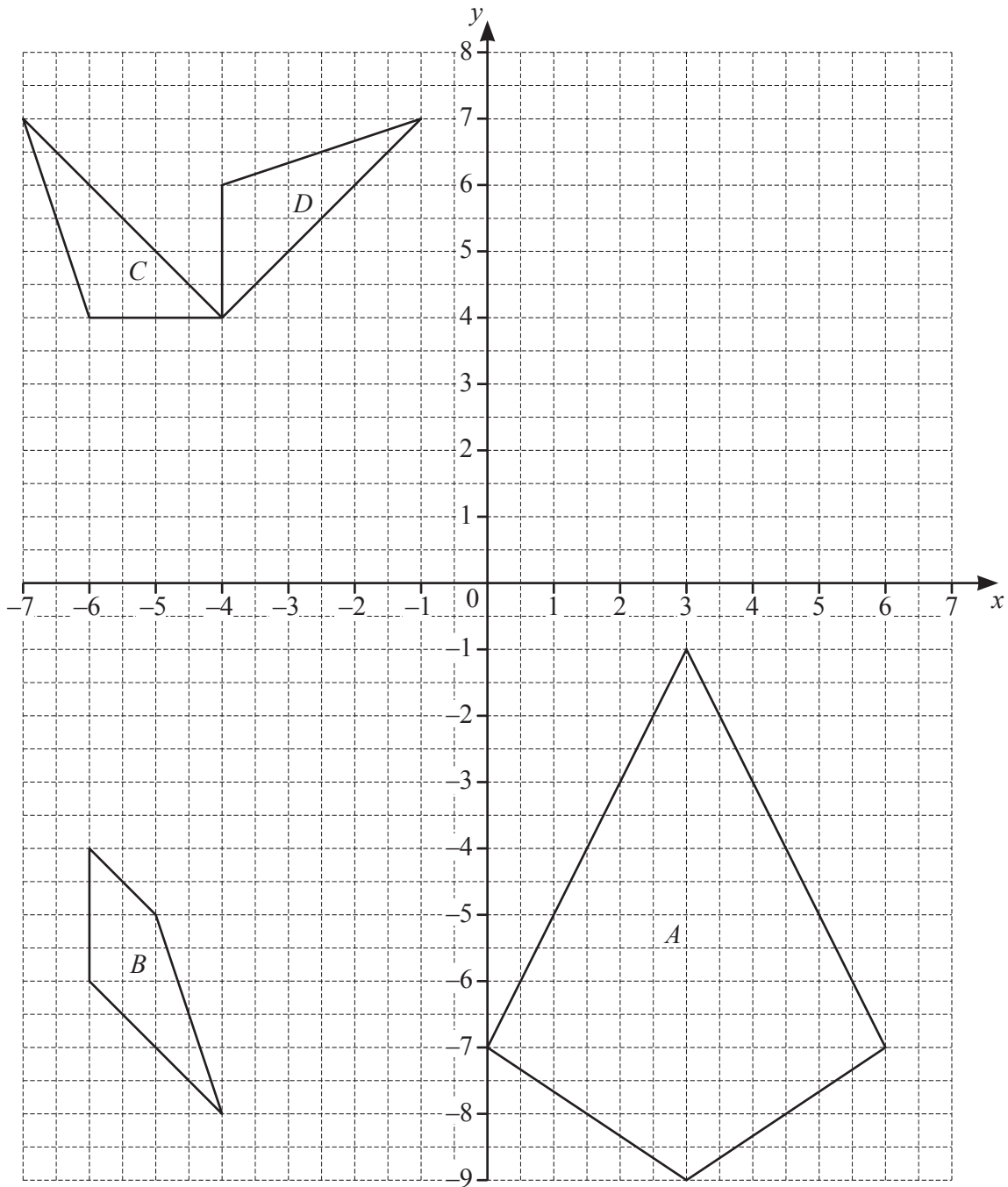
$$\dots\dots\dots = \dots\dots\dots [2]$$

- (iii) Solve your two simultaneous equations to find h and p .
You must show all your working.

$$h = \dots\dots\dots$$

$$p = \dots\dots\dots [4]$$

6 (a)



(i) On the grid, draw the image of

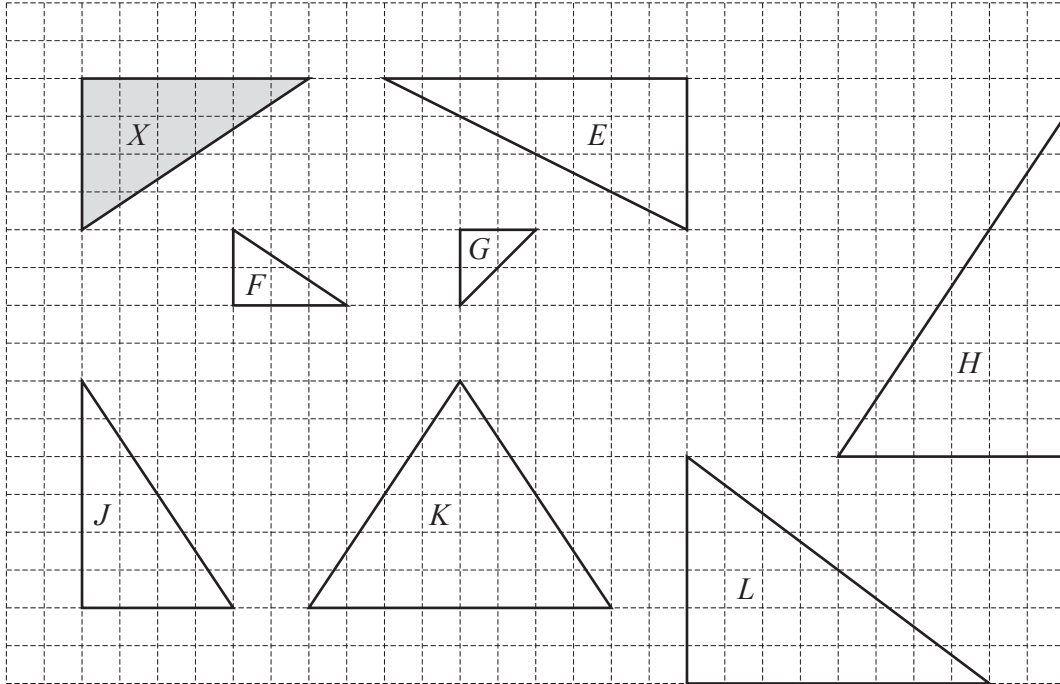
(a) shape *A* after an enlargement with scale factor $\frac{1}{2}$, centre $(3, -5)$, [2]

(b) shape *B* after a reflection in the line $y = -3$. [2]

(ii) Describe fully the **single** transformation that maps triangle *C* onto triangle *D*.

.....
 [3]

(b)



For the triangles shown on the grid, write down the letter of each triangle that is

(i) congruent to triangle *X*,

..... [1]

(ii) similar to triangle *X*.

..... [2]

- 7 (a) The scale drawing shows the positions of a rock, *R*, and a statue, *S*, on a map.
The scale is 1 centimetre represents 6 metres.



Scale: 1 cm to 6 m

- (i) Work out the actual distance between *R* and *S*.

..... m [2]

- (ii) A flagpole, *F*, is on a bearing of 164° from *S*.

Work out the bearing of *S* from *F*.

..... [2]

- (iii) Ishaan uses the map to find some treasure, *T*.
T is on a bearing of 076° from *R* and on a bearing of 337° from *S*.

Mark the position of *T* on the map.

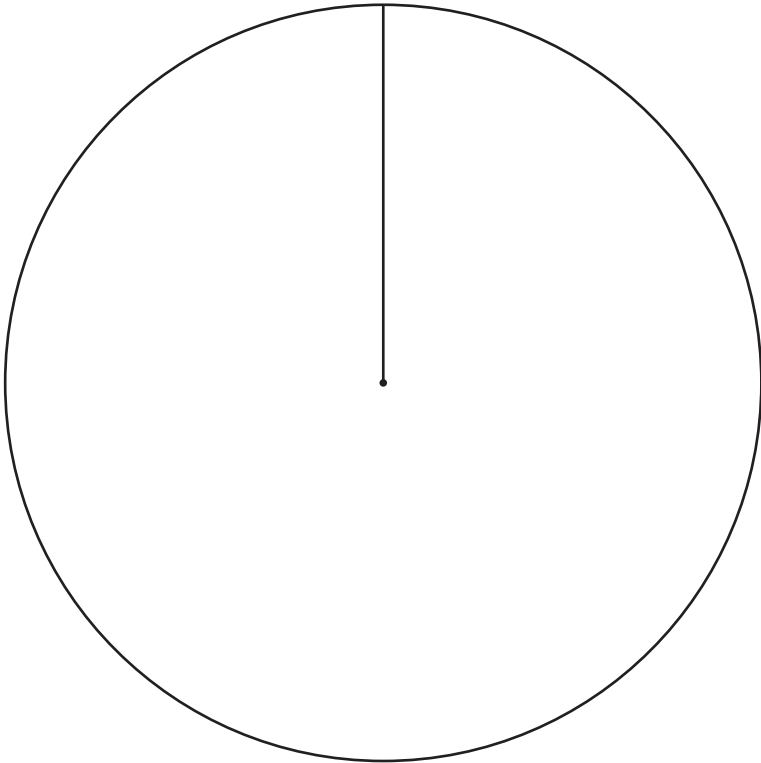
[2]

- (b) The treasure is a bag of coins.
The coins are made from three different metals.

Metal	Percentage	Pie chart sector angle
Copper	70%	
Zinc	20%	
Tin	10%	

(i) Complete the table. [2]

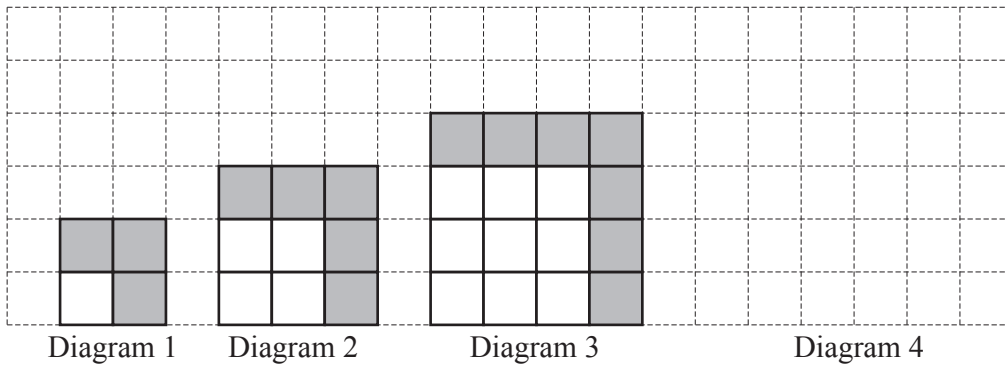
(ii) Complete the pie chart.



[2]

8 The grid shows the first three diagrams in a sequence.

Each diagram is made using small squares that are white or grey.



(a) On the grid, draw Diagram 4. [1]

(b) Write down the term to term rule for the number of grey squares.
 [1]

(c)

Diagram number	1	2	3	4		n
Number of small white squares	1	4	9			
Number of small grey squares	3	5	7			
Total number of small squares	4	9	16			

Complete the table. [6]

(d) Work out the number of small white squares in Diagram 18.

..... [1]

(e) One of the diagrams has a total of 900 small squares.

Work out its Diagram number.

Diagram [2]

(f) Another diagram has 43 small grey squares.

Work out the total number of small squares in this diagram.

..... [3]

- 9 (a) $\mathcal{U} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$
 $F = \{x: x \text{ is a factor of } 14\}$
 $P = \{x: x \text{ is a prime number less than } 14\}$

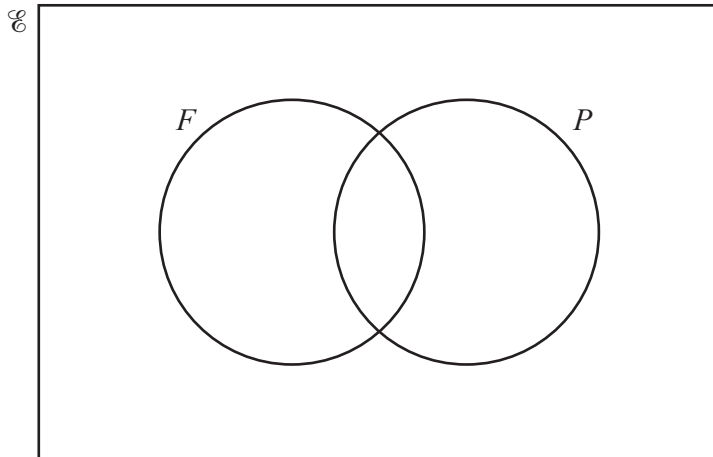
(i) Write down the elements in set F .

$F = \{ \dots \}$ [2]

(ii) Write down the elements in set P .

$P = \{ \dots \}$ [2]

(iii)



(a) Complete the Venn diagram.

[2]

(b) Write down $n(F \cap P)$.

..... [1]

(c) A number is chosen at random from the universal set \mathcal{U} .

Write down the probability that the number is in the set $F \cup P$.

..... [2]

(b) Write 195 as a product of its prime factors.

..... [2]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.