Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

9397999940

MATHEMATICS **0580/32**

Paper 3 (Core) **February/March 2021**

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.

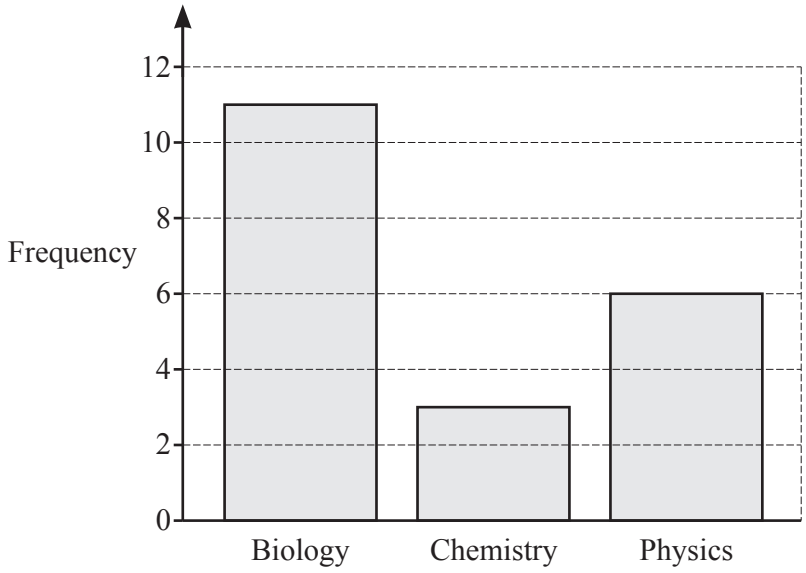
INFORMATION

- 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. Any blank pages are indicated.

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1 20 students choose their favourite science subject.
The results are shown in the bar chart.



(a) Work out how many more students choose biology than physics.

..... [1]

(b) Write down the fraction of students whose favourite science subject is chemistry.

..... [1]

(c) One of the 20 students is picked at random.

Write down the probability that this student did **not** choose biology.

..... [2]

(d) Only **one** of the averages, median, mode and mean can be found for these results.

(i) Write down the average that can be found.

..... [1]

(ii) Find this average for these results.

..... [1]

(iii) Explain why the range cannot be found.

..... [1]

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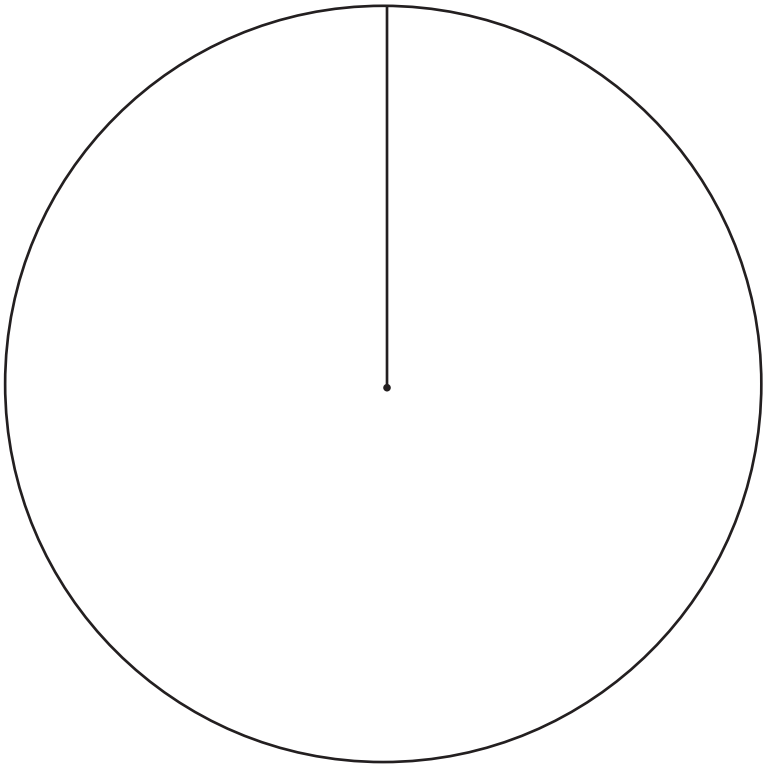
(e) The results are to be shown in a pie chart.

(i) Complete the table.

Favourite science	Frequency	Pie chart sector angle
Biology		
Chemistry		
Physics		

[3]

(ii) Complete the pie chart.



[2]

2 A family go on a skiing holiday to America.

(a) The hotel has 840 rooms.
735 rooms are occupied.

Calculate the percentage of rooms that are occupied.

.....% [1]

(b) The temperature in the hotel is 21 °C.
The temperature in the hotel is 26.7 °C warmer than at the top of the mountain.
The temperature at the top of the mountain is 3.2 °C colder than at the bottom of the mountain.

Work out the temperature at the bottom of the mountain.

..... °C [2]

(c)

	Equipment	Hire cost ($)		
		3 days	4 days	7 days
Adult	Ski equipment	80.80	94.60	128.00
	Snowboard equipment	96.80	112.60	151.20
	Helmet	12.80	15.20	20.70
Child	Ski equipment	47.60	55.40	75.80
	Snowboard equipment	59.00	70.20	94.60
	Helmet	10.40	12.00	16.70

There are two adults and one child in the family.
They hire all their equipment.

The child skis for 3 days and snowboards for 4 days.
Both adults ski for 7 days.
All three of them hire a helmet for 7 days.

Work out the total cost of the equipment hire for the family.

$ ..... [2]

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(d) A ski lift, when full, takes 4000 passengers per hour.
This lift works for 10 hours a day.
One day, this lift is 90% full for 3 hours and 75% full for 7 hours.

Work out the number of passengers who take the lift that day.

..... [3]

(e) The family buy their lift passes before the holiday for a total of 51 400 rupees.
In America, the passes cost a total of \$684.
The exchange rate is 1 rupee = \$0.0129 .

Show that the family save 1620 rupees, correct to the nearest 10 rupees, by buying the passes before their holiday.

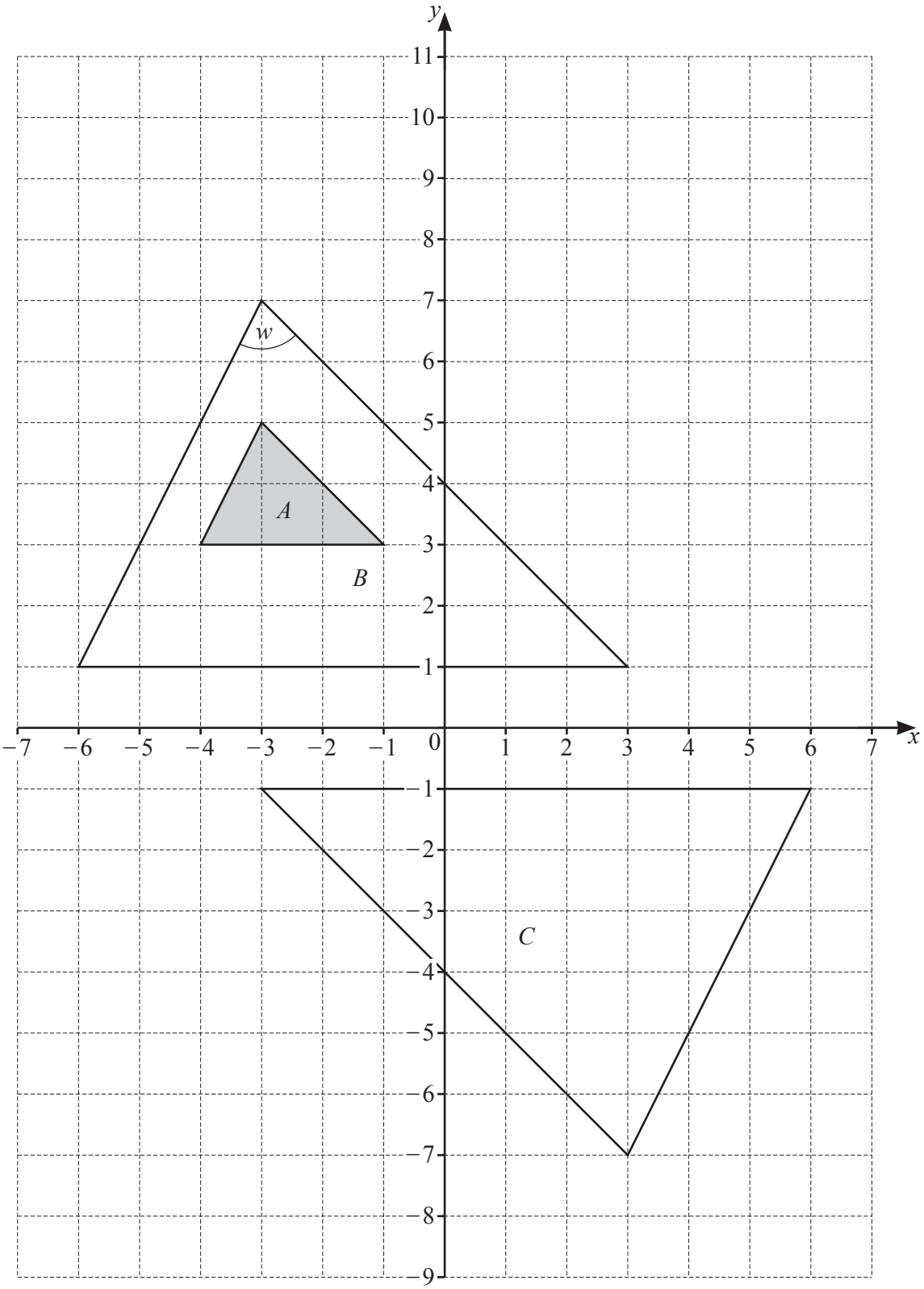
[3]

(f) The height, h metres, of the mountain is 2642 m, correct to the nearest metre.

Complete this statement about the value of h.

..... $\leqslant h <$ ..... [2]

3 The diagram shows three triangles *A*, *B* and *C* on a grid.
Triangle *A* is shaded.



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(a) Measure angle w.

Angle $w =$ ..... [1]

(b) Explain why triangle B is congruent to triangle C.

..... [1]

(c) Describe fully the **single** transformation that maps

(i) triangle A onto triangle B,

.....

..... [3]

(ii) triangle B onto triangle C.

.....

..... [3]

(d) On the grid, draw the image of

(i) shape A after a translation by the vector $\begin{pmatrix} 7 \\ -1 \end{pmatrix}$, [2]

(ii) shape A after a reflection in the line $y = -1$. [2]

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4 The scale drawing shows the positions of Kendra's house, K, and Latika's house, L, on a map.



(a) Jesminder's house, J, is on a bearing of 036° from K and on a bearing of 284° from L.

Mark the position of J on the map. [2]

(b) The actual distance between K and L is 9600 metres.

(i) Complete the scale of the map.

1 cm represents ..... metres [2]

(ii) Kendra walks from K to L at a constant speed of 4.5 km/h.
She leaves K at 10 15.

Work out the time she arrives at L.

..... [3]

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(c) (i) Kendra and Latika leave Latika's house at 15 00 to go to the cinema.

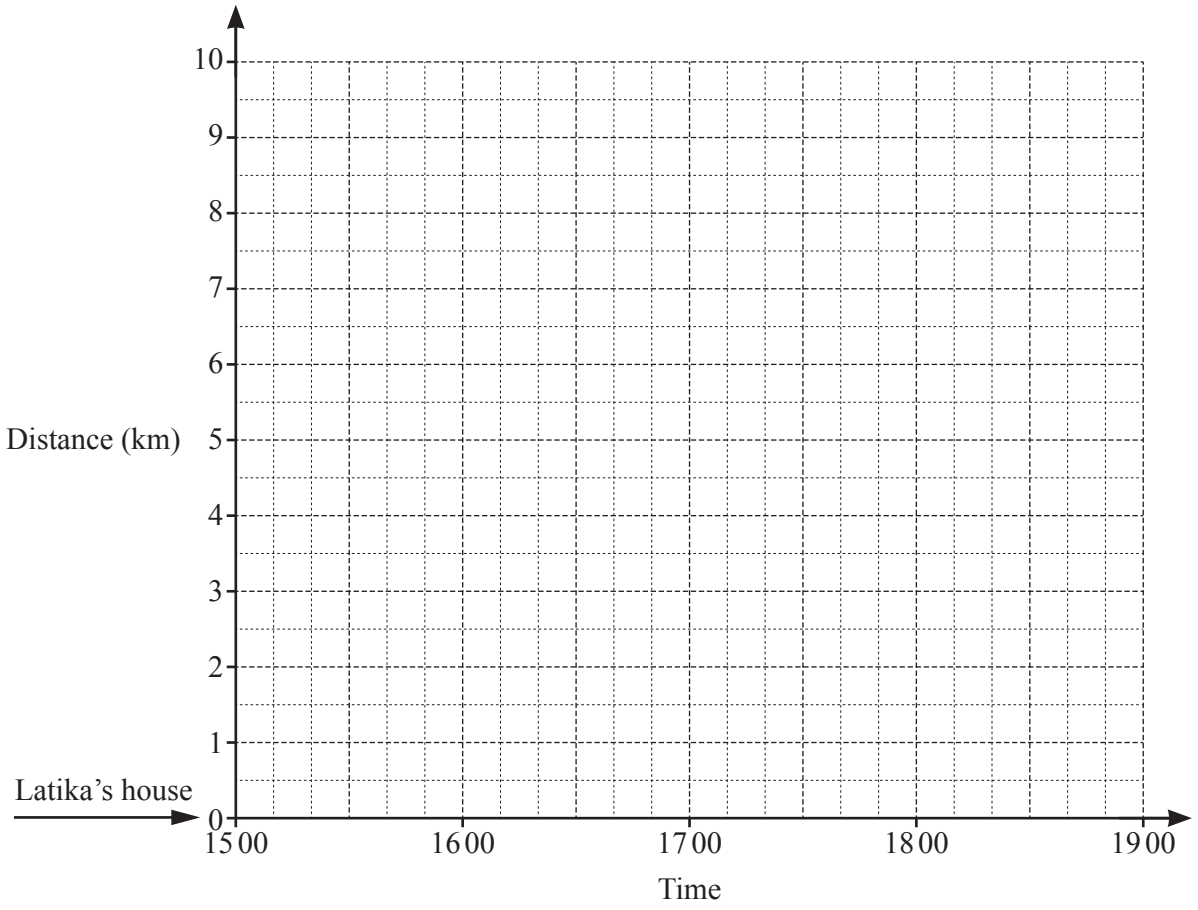
(a) They walk for 20 minutes at a constant speed of 4.5 km/h.

Work out the distance they walk.

..... km [1]

(b) After walking for 20 minutes, they then run a distance of 6 km at a constant speed for 40 minutes.

Draw their journey to the cinema on the travel graph.



[2]

(ii) Kendra and Latika leave the cinema at 18 05.
They travel back to Latika's house in a taxi at a constant speed of 30 km/h.

Complete the travel graph.

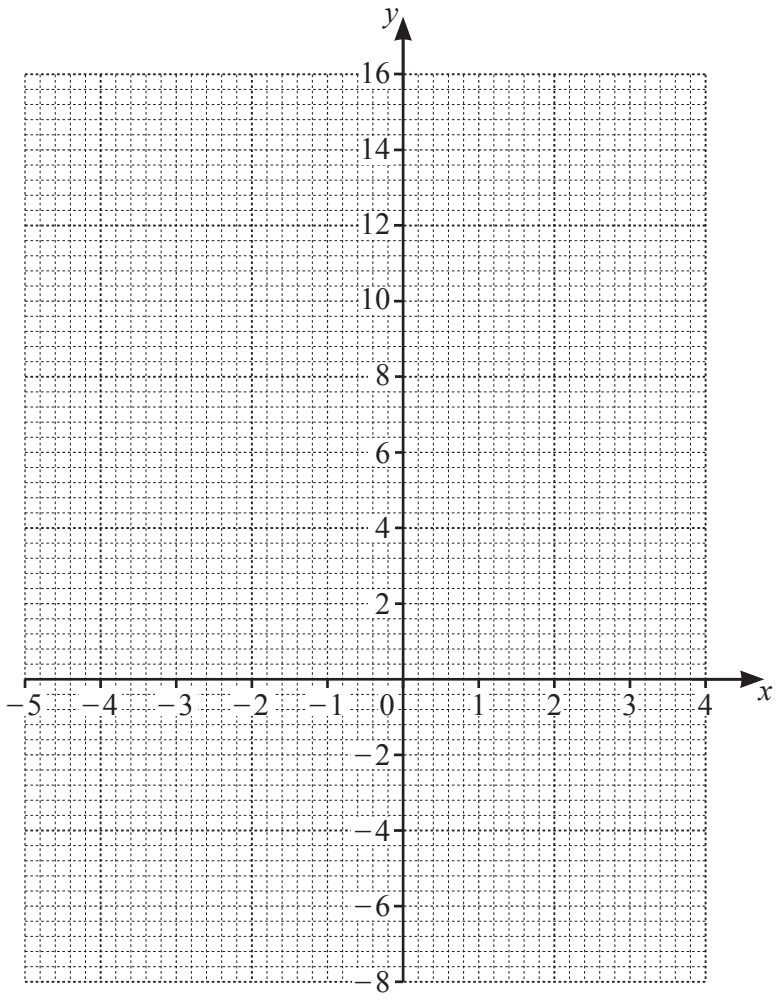
[2]

5 **(a)** Complete the table of values for $y = -x^2 - x + 14$.

x	–5	–4	–3	–2	–1	0	1	2	3	4
y			8	12			12	8		

[3]

(b) On the grid, draw the graph of $y = -x^2 - x + 14$ for $-5 \leqslant x \leqslant 4$.



[4]

(c) **(i)** Write down the equation of the line of symmetry of the graph.

..... [1]

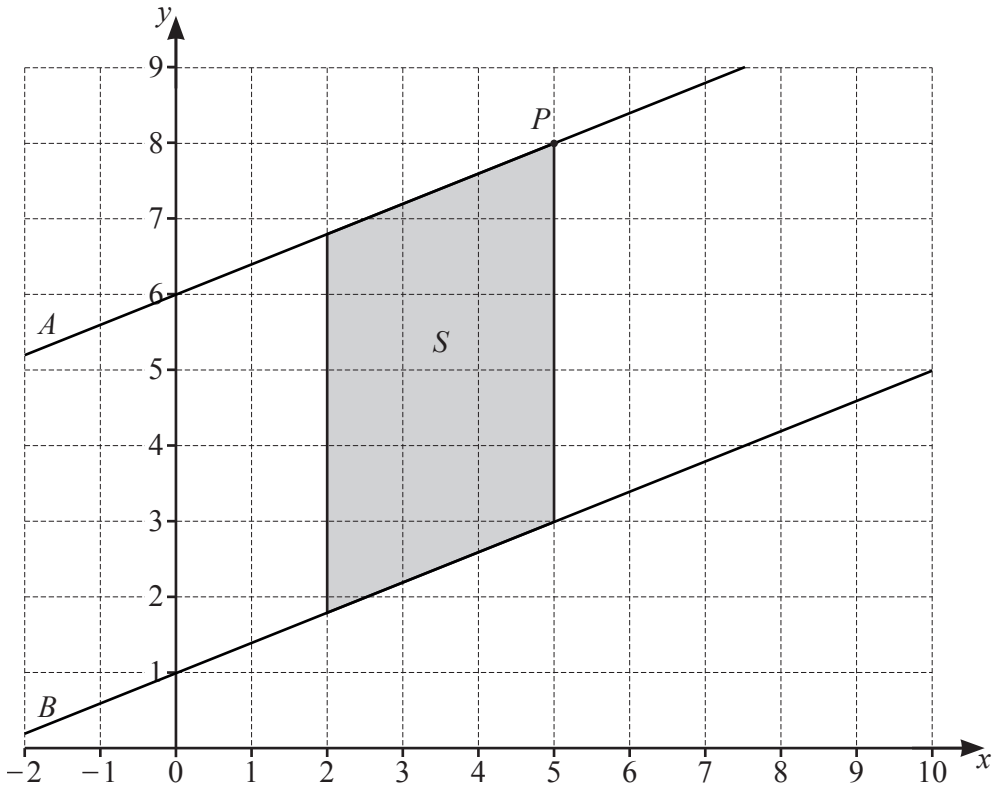
(ii) Find the coordinates of the highest point on the graph.

(..... , ...) [1]

(d) Use your graph to solve the equation $-x^2 - x + 14 = -2$.

$x =$ ..... or $x =$ ..... [2]

6 The diagram shows a point P, a shape S and lines A and B on a 1cm^2 grid.



(a) Line A is parallel to line B.

Explain what parallel means.

..... [1]

(b) Write down the coordinates of point P.

(..... , ...) [1]

(c) **(i)** Write down the mathematical name for shape S.

..... [1]

(ii) Work out the area of shape S.

..... cm^2 [1]

(d) (i) Find the gradient of line A.

..... [1]

(ii) Write down the equation of line A.

..... [2]

7 Prakash buys 45 flowers from a shop.

(a)

Special offer
Buy 3 bunches of flowers for the price of 2 bunches.

Each bunch has 5 flowers.
The price of one bunch of flowers is $2.68 .

Using the special offer, work out how much Prakash pays for the 45 flowers.

$ ..... [3]

(b) 15 of the flowers are red.
18 of the flowers are orange.
The rest of the flowers are yellow.

Write down the ratio of the number of red flowers : orange flowers : yellow flowers.
Give your answer in its simplest form.

..... : ..... : ..... [2]

(c) Prakash gives the 45 flowers to his family.

He gives his grandmother x flowers.
He gives his mother 8 more flowers than his grandmother.
He gives his cousin 6 fewer flowers than his grandmother.
He gives his sister twice as many flowers as he gives his cousin.

(i) Use this information to show that $5x - 10 = 45$.

[3]

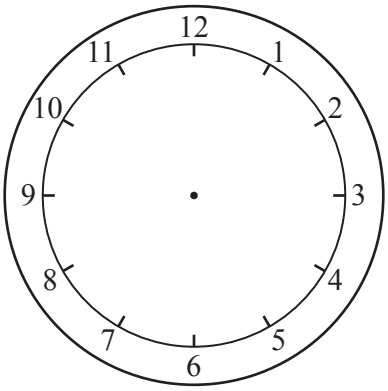
(ii) Solve the equation $5x - 10 = 45$.

$x =$ ..... [2]

(iii) Find the number of flowers that Prakash gives to his cousin.

..... [1]

8 **(a)** A baker puts some cakes in the oven at 5.50 pm.
The cakes take 20 minutes to bake.



Complete the clock diagram to show the time when the cakes are baked. [1]

(b) A recipe uses 550 g of flour to make 8 cakes.

Work out the amount of flour needed to make 360 cakes.
Give your answer in kilograms.

..... kg [3]

(c)



NOT TO SCALE

Work out which bag of flour is the best value.
Show all your working.

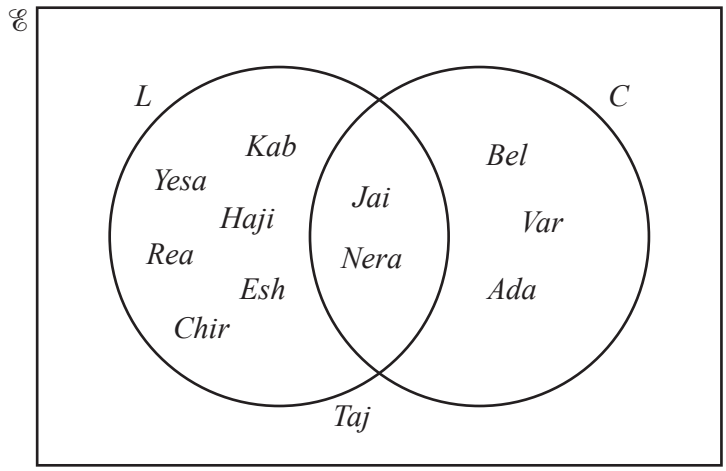
Bag ..... [3]

(d) One cake costs 24 cents to make.
The baker sells each cake for 65 cents.

Calculate the percentage profit the baker makes on each cake.

.....% [2]

(e) The baker asks some customers if they like lemon cake (L) and if they like chocolate cake (C).
The Venn diagram shows the results.



(i) Complete the statement.

$n(\mathscr{E})$ = ... [1]

(ii) Work out the fraction of the customers who like lemon cake or chocolate cake but not both.

..... [1]

(iii) Use set notation to complete the statement.

{*Jai, Nera*} = ... [1]

(iv) What does the Venn diagram show about Taj?

..... [1]

9 (a)



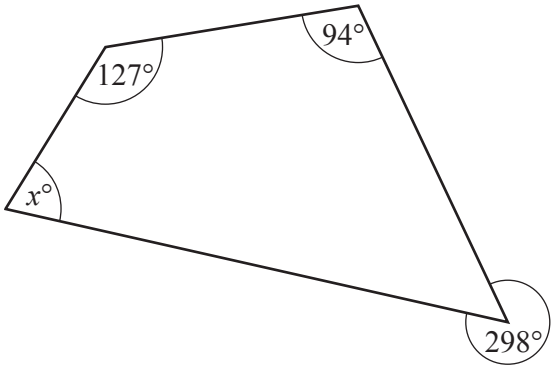
On the 1cm^2 grid, draw **one** rectangle that has

- a perimeter of 22 cm

and

- an area of 24 cm^2. [2]

(b)



NOT TO SCALE

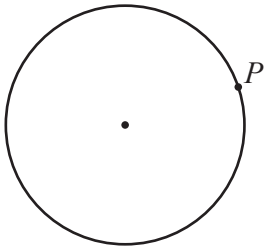
Work out the value of x.
Write down the two geometrical properties needed to find x.

1 .....

2 .....

$x =$ ..... [4]

(c)



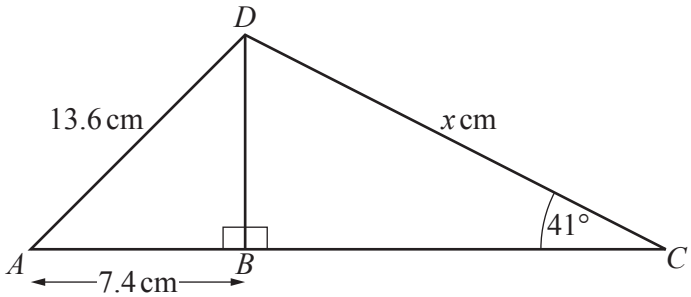
Draw a tangent to the circle at point P. [1]

(d) The exterior angle of a regular polygon is 24°.

Work out the number of sides of this polygon.

..... [1]

(e)



NOT TO SCALE

Calculate the value of x.

$x =$ ..... [5]

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