Anglo-Chinese School
(Primary)
A Methodist Institution
(Founded 1886)

2024 P6 PRELIMINARY EXAM
MATHEMATICS
PAPER 1 (BOOKLET A)
PRIMARY SIX

Name: _____ ( ) **Class: Primary 6** ___

Date: 16 August 2024 **Duration of Booklets A & B: 1 hour**

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of **12** printed pages, including the cover page.
2. Do not turn this page until you are told to do so.
3. Follow all instructions carefully.
4. Shade your answers on the Optical Answer Sheet (OAS) provided.
5. You are not allowed to use a calculator.

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Questions **1** to **10** carry 1 mark each. Question **11** to **15** carry 2 marks each.
Make your choice (1, 2, 3 or 4). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet (OAS). (20 marks)

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1. Which of the following is seven hundred and three thousand and twelve in numerals?

   (1) 730 012

   (2) 703 012

   (3) 73 012

   (4) 70 312

2. Divide 2 by $\frac{8}{5}$

   (1) $\frac{5}{16}$

   (2) $\frac{4}{5}$

   (3) $1\frac{1}{4}$

   (4) $3\frac{1}{5}$

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3. Round 4.195 to 2 decimal places.

(1) 4.10

(2) 4.19

(3) 4.20

(4) 4.29

4. $3 + \frac{3}{100} + \frac{30}{1000} =$ _____

(1) 3.033

(2) 3.06

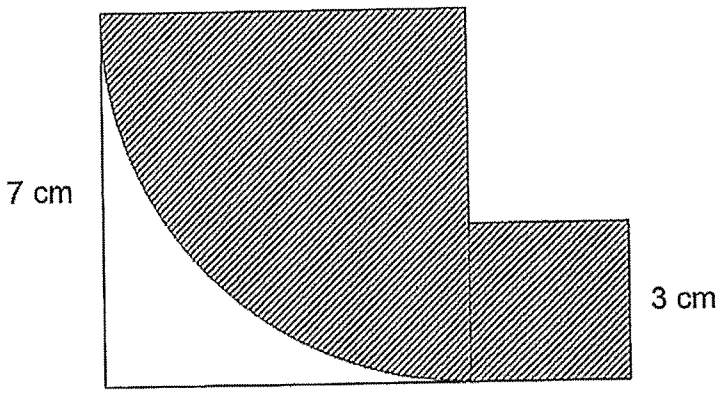
(3) 3.33

(4) 3.6

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5. The figure below is made up of 2 squares and one quarter circle. The lengths of the squares are 7 cm and 3 cm respectively. Find the perimeter of the shaded part.

(Take $\pi = \frac{22}{7}$)



(1) 19.5 cm

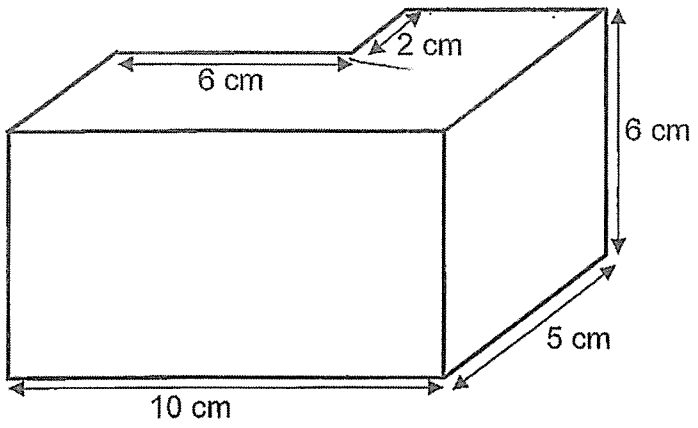
(2) 25 cm

(3) 25.5 cm

(4) 31 cm

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6. Study the solid below.



Find the volume of the solid.

(1) 228 cm^3

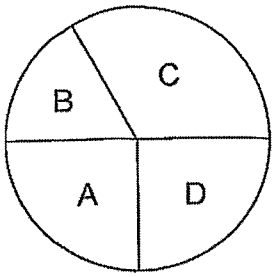
(2) 288 cm^3

(3) 300 cm^3

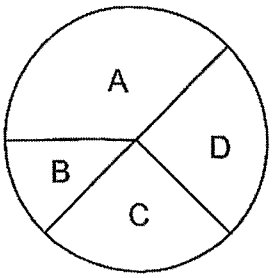
(4) 372 cm^3

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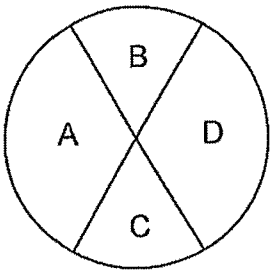
7. A sum of money was shared among Anne, Ben, Cindy and David. Anne had twice as much money as Ben. David had twice as much money as Cindy. Anne and David had the same amount of money.
Which pie chart represents the information above?



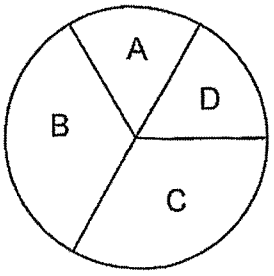
(1)



(2)



(3)



(4)

8. The average of three numbers is 40. The sum of another two numbers is 50. What is the average of the 5 numbers?

(1) 13

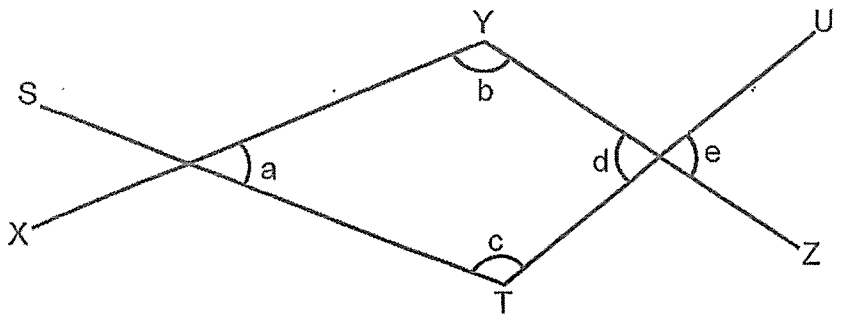
(2) 18

(3) 34

(4) 65

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9. The figure below is made up of four straight lines, ST, TU, XY and YZ.



Students J, K and L wrote the following statements.

Student	Statement
J	$\angle b = \angle c$
K	$\angle d = \angle e$
L	$\angle a + \angle c = 180°$

Which student(s) is/are correct?

(1) J only

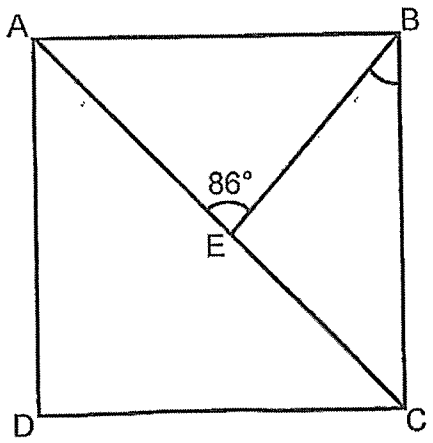
(2) K only

(3) J and L

(4) K and L

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10. ABCD is a square and $\angle AEB = 86°$. Find $\angle CBE$.



(1) 41°

(2) 43°

(3) 45°

(4) 49°

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11. In a marathon relay race, four runners ran one after another without any stop in between. The second runner started running at the same time the first runner completed running and so on. The chart below shows the time each runner started running. The last runner completed the race at 1.30 p.m..

Runner	Start Time
First	10.30 a.m.
Second	11.20 a.m.
Third	12.15 a m.
Last	12.55 p.m.

How much more time did the slowest runner take than the fastest runner?

(1) 15 min

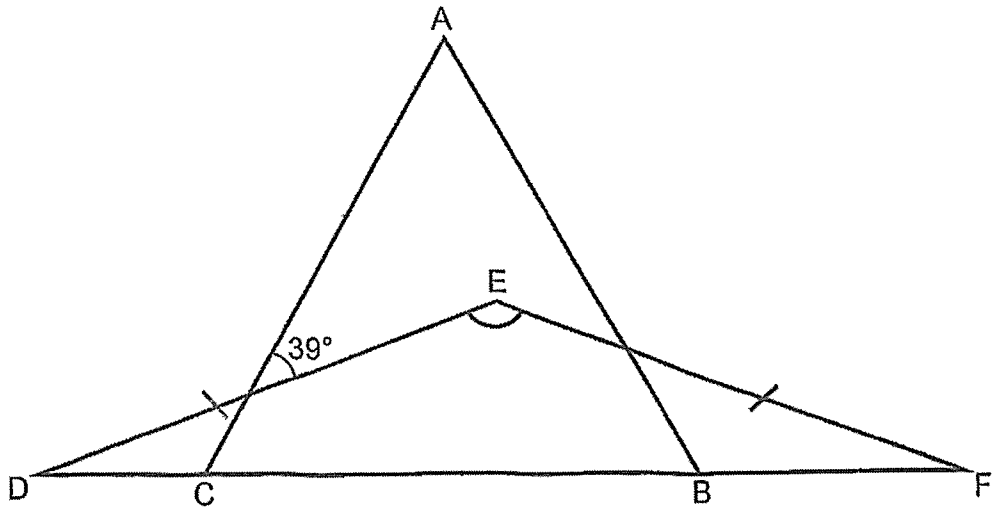
(2) 20 min

(3) 35 min

(4) 55 min

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12. In the figure below, ABC is an equilateral triangle and DEF is an isosceles triangle. DE = EF. Find ∠DEF.



(1) 102°

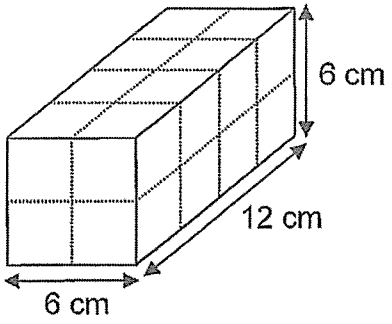
(2) 120°

(3) 138°

(4) 141°

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13. The figure below shows a cuboid made up of 16 identical small cubes. All the faces of this cuboid including the base are painted green. This cuboid was then cut into 2 big identical cubes, each made up of 8 small cubes. Find the total area of the unpainted faces of these 2 big cubes.



(1) 36 cm²

(2) 72 cm²

(3) 144 cm²

(4) 216 cm²

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14. Aaron had \$55 more than Shanti at first. After Aaron used $\frac{2}{5}$ of his money and Shanti used $\frac{1}{3}$ of her money, Aaron had \$27 more than Shanti. How much did Shanti have left at the end?

(1) \$27

(2) \$30

(3) \$54

(4) \$60

15. A sum of money was shared between John and Ken in the ratio 3 : 4. John used all his money to buy 8 identical toy cars that cost \$1.50 each. Ken used some of his money to buy 3 such toy cars. How much money had Ken left?

(1) \$4.50

(2) \$11.50

(3) \$12

(4) \$16

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Anglo-Chinese School
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2024 P6 PRELIMINARY EXAM
MATHEMATICS
PAPER 1 (BOOKLET B)
PRIMARY SIX

Name: _____ ( ) Class: Primary 6 ___

Date: 16 August 2024 Duration of Paper Booklets A & B: 1 hour

_____
Parent's/Guardian's signature

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of 9 printed pages, including the cover page.
2. Do not turn this page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Use a dark blue or black ballpoint pen to write your answers in the space provided for each question.
6. Do not use correction fluid/tape or highlighters.
5. You are not allowed to use a calculator.

Section	Maximum Marks	Marks Obtained
Paper 1 Booklet A. Multiple-Choice Questions	20	
Paper 1 Booklet B. Short Answers: Part 1	5	
Paper 1 Booklet B. Short Answers: Part 2	20	
Total Marks	45	

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Questions 16 to 20 carry 1 mark each. Write your answers in the spaces provided. Give your answers to the units stated and to its simplest form whenever necessary. (5 marks)

16. Find the value of $20 - (4 + 8 \div 4) + 5$

Ans: _____

17. Find the value of $68.2 \div 4$

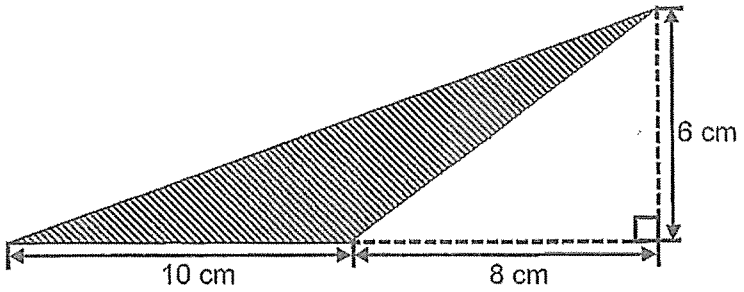
Ans: _____

18. May's clock at home slows down 1 minute after every 6 hour since the battery runs low from 12 midnight. It is now showing 6.00 p.m.. What should be the correct time now? Leave your answer in 24-hour clock.

Ans: _____

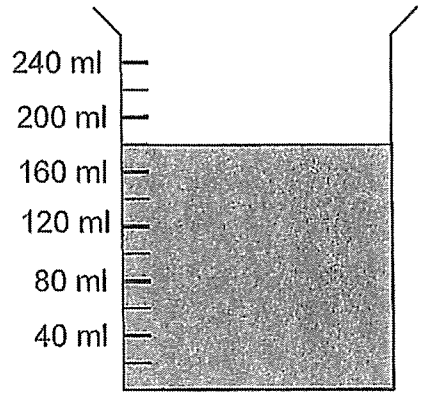
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19. What is the area of the shaded triangle?



Ans: _____ cm^2

20. The amount of water in a beaker at first is shown as below. After Zoe poured in 50 ml of water into the beaker, what is the total amount of water in the beaker now?

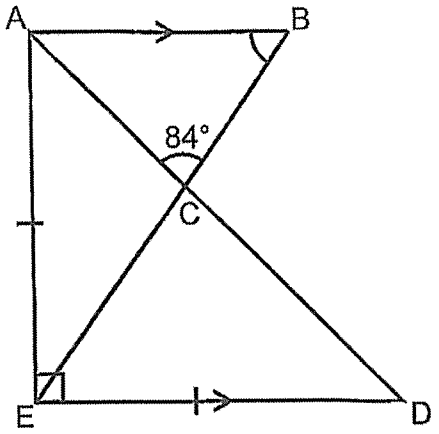


Ans: _____ ml

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Questions 21 to 30 carry 2 marks each. Show all mathematical statements clearly in the space below each question and write your answers in the spaces provided. Give your answers to the units stated and to its simplest form whenever necessary. (20 marks)

21. In the figure below, ADE is a right-angled isosceles triangle and BE is a straight line. AE = DE and ∠ACB = 84°. Find ∠ABC.



Ans: _____°

22. A baker had three boxes of flour weighing 2.7 kg, 3.4 kg and 5.02 kg. He repacked them equally into four bags. What is the mass of each bag?

Ans: _____ g

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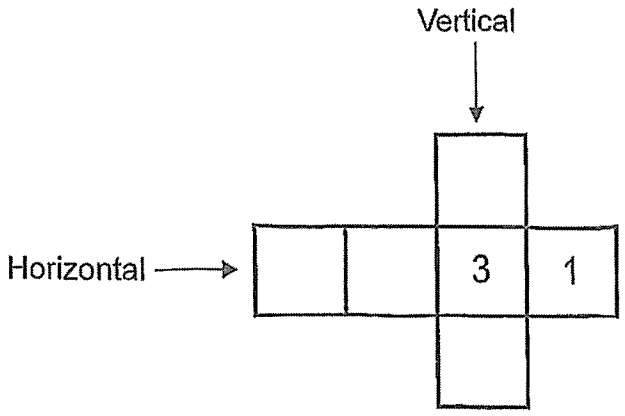
23. The table below shows the prices of pens and erasers sold at a bookshop.

Item	Price per item
Eraser	b cents
Pen	$2b$ cents

Mark spent $4.20 on 5 erasers and 1 pen. Find the value of b.

Ans: _____

24. The figure below shows the net of a cube. Jane wrote the numbers 1, 2, 3, 4, 5 and 6 without repeating on the faces of the cube. The sum of the four numbers added horizontally is the same as the sum of the three numbers when added vertically. When the net is folded to form a cube, '3' is seen on the bottom of the cube. What are the two possible numbers on the top of the cube?



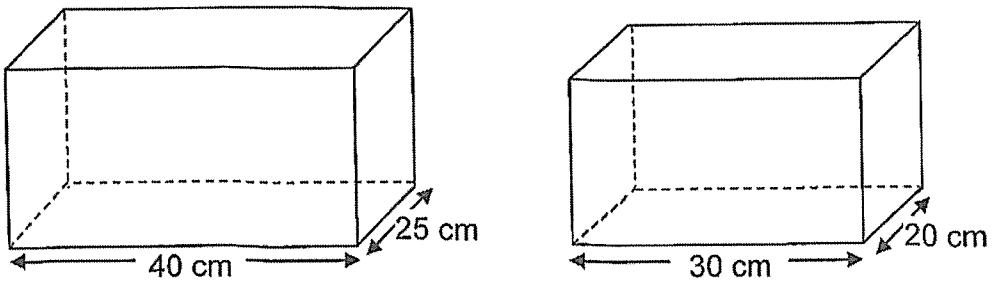
Ans: _____ and _____

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25. Mrs Goh had 25 apples and some pears at first. She gave away some apples and $\frac{1}{4}$ of the remaining fruits were pears. After buying 8 mangoes, $\frac{1}{6}$ of the total number of fruits were pears. How many apples did Mrs Goh give away?

Ans: _____

26. Two empty tanks with bases measuring 40 cm by 25 cm and 30 cm by 20 cm are shown below. Both tanks are filled with a total of 8 litres of water to the same height. What is the height of the water level in both tanks?

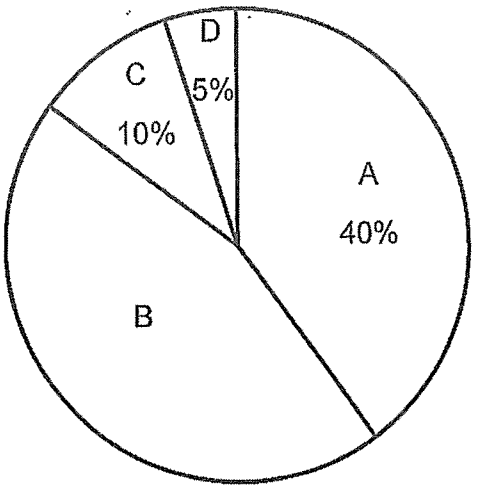


Ans: _____cm

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The table below shows a group of students and the number of digital devices they owned in a survey conducted. The pie chart shows the percentage of students in each group. Study the table and pie chart carefully. Answer questions 27 and 28.

Group	Number of digital devices
A	0
B	1
C	2
D	More than 2



27. According to the survey, 80 students did not have any digital devices. What fraction of the total number had only 1 digital device?
Give your answer in the simplest form.

Ans: _____

28. How many students had more than 1 devices?

Ans: _____

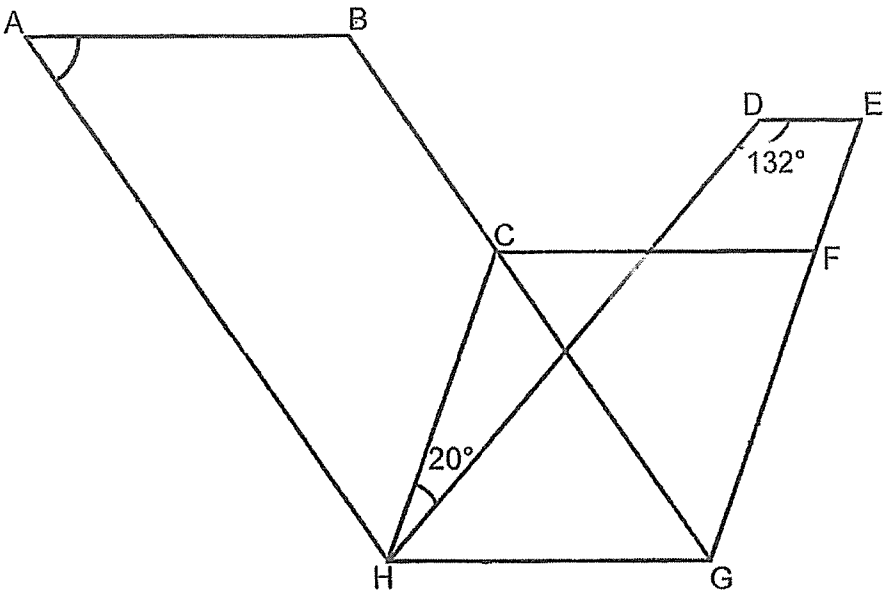
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29. Peter spent $60 of his weekly allowance and saved the rest. During Christmas, his spending increased by 20%. As a result, his savings decreased by 10%. How much was his weekly allowance?

Ans: $_____

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30. In the figure below, ABGH is a parallelogram, CFGH is a rhombus and DEGH is a trapezium. $\angle EDH = 132°$ and $\angle CHD = 20°$. Find $\angle BAH$.



Ans: _____ °

End of Paper 1

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Anglo-Chinese School
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2024 P6 PRELIMINARY EXAM
MATHEMATICS
PAPER 2
PRIMARY SIX

Name: _____ ( ) Class: Primary 6 ___

Date: 16 August 2024 Duration of Paper 2: 1 hour 30 minutes

_____
Parent's/Guardian's signature

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of **15** printed pages, including the cover page.
2. Do not turn this page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Use a dark blue or black ballpoint pen to write your answers in the space provided for each question.
6. Do not use correction fluid/tape or highlighters.
7. You are allowed to use a calculator.

Section	Maximum Marks	Marks Obtained
Paper 2 Section A. Short Answers	10	
Paper 2 Section B. Problem Sums	45	
Total Marks	55	

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Questions **1** to **5** carry 2 marks each. Show your mathematical statements clearly in the space provided for each question and write your answers in the spaces provided. Give your answers to the units stated and to its simplest form whenever necessary.

(10 marks)

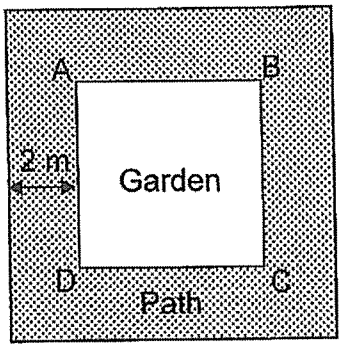
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1. Which column can the number 100 be found in the table below?

A	B	C	D	E	F
1		2		3	
	4		5		6
7		8		9	
	10		11		12

Ans: _____

2. A 2-m wide path was built around a square garden ABCD as shown below.
The area of the shaded path is 56 m². What is the area of the square garden ABCD?



Ans: _____ m²

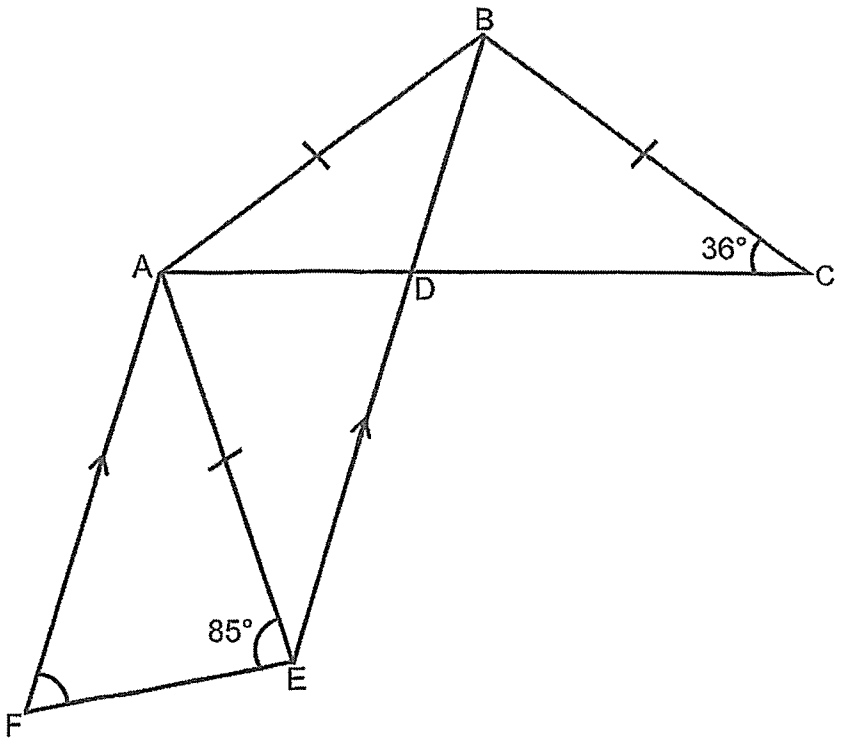
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3. Ahmad bought some books which cost an average of $26. Two of the books cost $46 and $34 respectively. The average cost of the remaining books was $22.

Each of the statements below is either true, false or not possible to tell from the information given. For each statement, put a tick (✓) to indicate your answer.

Statement	True	False	Not possible to tell
Ahmad bought more than 10 books.			
Two of the books cost an average of $24.			

4. In the figure below, ABC and ABE are identical isosceles triangles. AF is parallel to BE, AB = AE = BC, ∠BCA = 36° and ∠AEF = 85°. Find ∠AFE.



Ans: _____ °

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5. May had some chocolates and lollipops in the ratio of 3 : 4 at first. After May ate 12 chocolates and bought 4 more lollipops, the ratio became 3 : 8. What was the total number of chocolates and lollipops May had in the end?

Ans: _____

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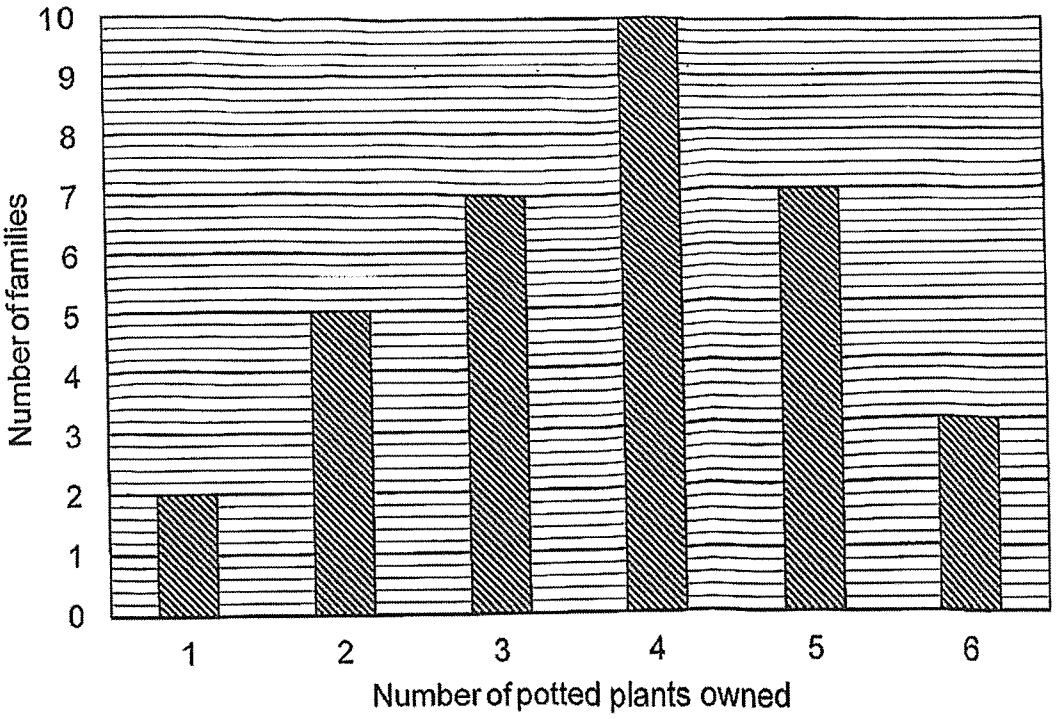
For questions **6** to **17**, show your steps clearly in the space provided for each question and write your answers in the spaces provided. For questions which require units, give your answers in the units stated.
The number of marks available is shown in brackets [ ] at the end of each question or part-question. (45 marks)

6. Julie had 5 times as many coins as Gavin at first. She gave $\frac{1}{4}$ of her coins to Gavin. Then Gavin used $\frac{1}{3}$ of his total coins. In the end, Julie had 189 coins more than Gavin. How many coins did Julie and Gavin had at first?

Ans: _____ [3]

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7. The bar graph below shows the number of potted plants owned by different families in a housing estate.



(a) What is the total number of potted plants in the housing estate?

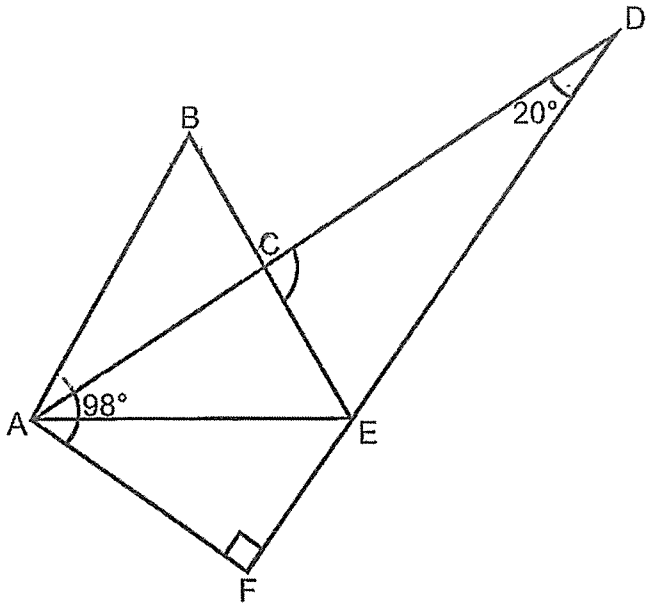
Ans: _____ [2]

(b) What is the ratio of the number of families with 3 or less potted plants to the number of families with more than 3 potted plants?
Give your answer in the simplest form.

Ans: _____ [1]

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8. In the figure below, ABE is an equilateral triangle and ADF is a right-angled triangle. $\angle ADF = 20°$ and $\angle BAF = 98°$. Find $\angle DCE$.



Ans: _____ [3]

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9. Sean left City A for City B travelling at a constant speed of 80 km/h. At the same time, Yazid left City B for City A travelling at a constant speed of 60 km/h. Sean and Yazid passed each other at 30 km from the midpoint. What is the distance between City A and City B?

Ans: _____ [3]

10. Mdm Siti bought $4p$ kg of beef at \$7 per kg and $6p$ kg of chicken at \$8 per kg for Hari Raya.

(a) Express the total amount she spent in terms of p.

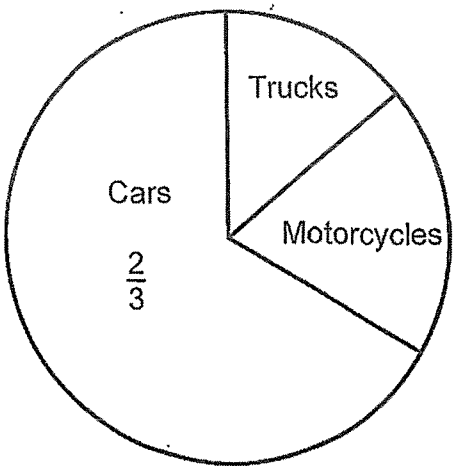
Ans: _____ [2]

(b) If $p = 2$, find the total amount spent.

Ans: _____ [1]

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11. The pie chart below represents the number of cars, motorcycles and trucks in a car park. The ratio of the number of trucks to the number of motorcycles is 5 : 7. There are 48 cars in the car park.



(a) How many trucks are there in the car park?

Ans: _____ [1]

(b) The cars and trucks have 4 wheels each while the motorcycles have 2 wheels each. Find the total number of wheels represented in the pie chart.

Ans: _____ [2]

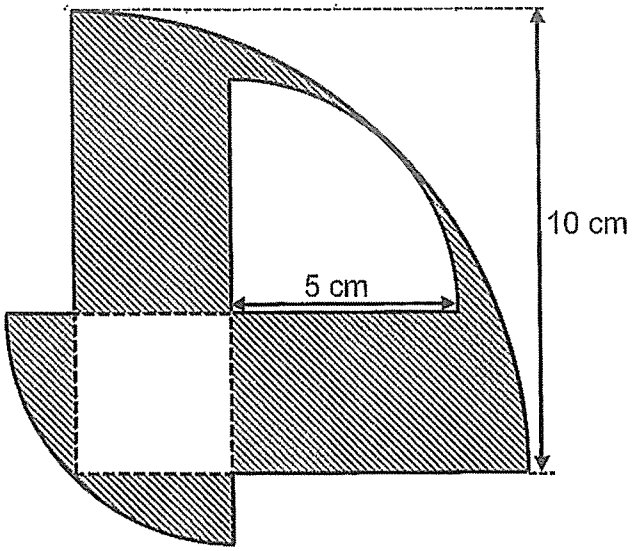
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12. At first, Sam had $\frac{2}{5}$ as much money as Paul. Ean had $36 more than Sam. After Paul gave $98 to Sam and some money to Ean, all three boys had the same amount of money. How much did they have altogether?

Ans: _____ [4]

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13. The figure below is made up of a big quarter circle, two small identical quarter circles and a square. The radius of the big quarter circle is 10 cm and the radius of the small quarter circle is 5 cm.



(a) Find the area of the square.

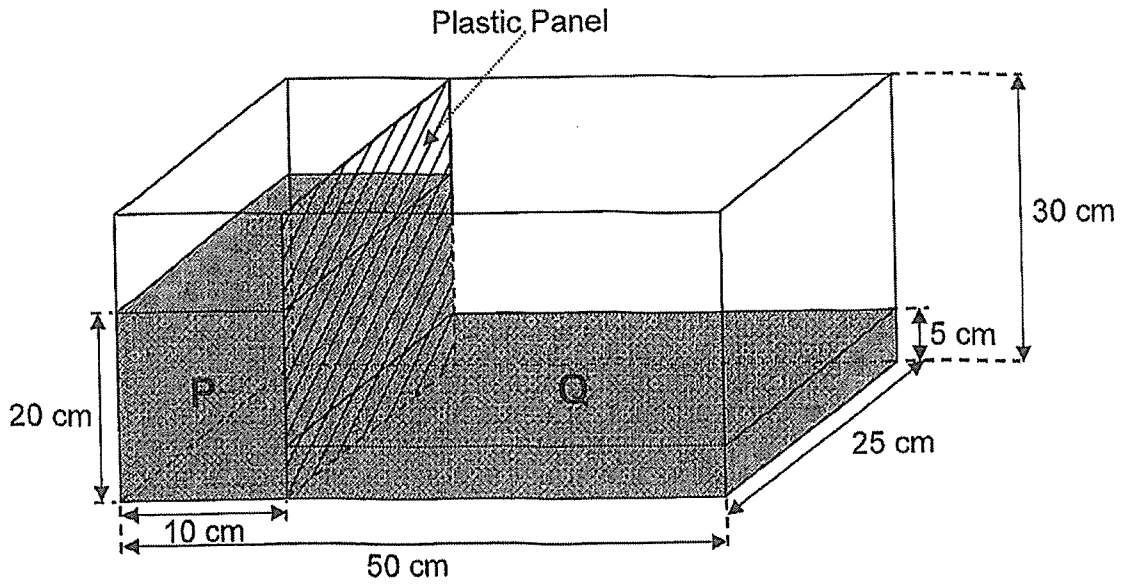
Ans: _____ [2]

(b) Find the total area of the shaded parts. (Take $\pi = 3.14$)

Ans: _____ [2]

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14. A rectangular tank, 50 cm by 25 cm by 30 cm is separated into two compartments P and Q by a plastic panel as shown below.



(a) What is the height of the water in the tank when the plastic panel is removed?

Ans: _____ [3]

(b) How many more litres of water are needed to fill the tank to the brim after the plastic panel is removed?

Ans: _____ [2]

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15. Machine A and Machine B had the same mass of biscuits to be packed into identical boxes. The machines started packing at 2 p.m.. The table below shows the number of boxes packed by each machine and the remaining mass of biscuits after 15 minutes.

	Number of boxes packed	Remaining mass of biscuits
Machine A	250	700 g
Machine B	245	1.5 kg

(a) What was the mass of biscuits in each box? Give your answer in kilograms.

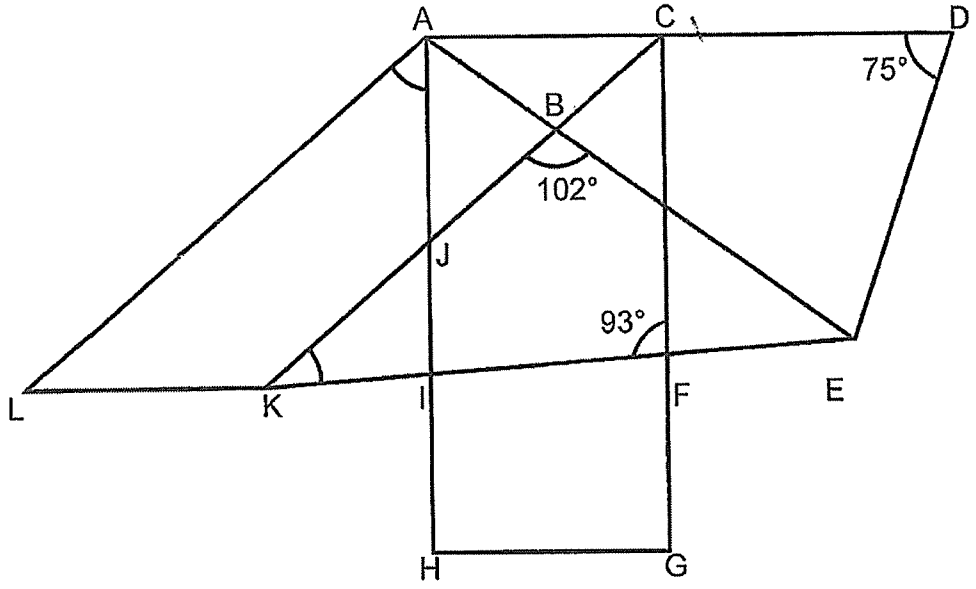
Ans: (a) _____ [2]

(b) At 2.15 p.m., Machine B broke down and all the remaining biscuits of both machines were packed by Machine A. After packing the maximum boxes possible, how many grams of biscuits were left at the end?

(b) _____ [2]

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16. In the figure below, ACKL is a parallelogram, ACGH is a rectangle and ADE is an isosceles triangle. KIFE is a straight line. AD = AE, ∠ADE = 75°, ∠EBK = 102° and ∠CFK = 93°.



(a) Find ∠LAJ.

Ans: (a) _____ [3]

(b) Find ∠JKI.

(b) _____ [2]

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17. Andy and Betty had 864 stamps altogether. Andy gave Betty some of his stamps and Betty's stamps increased by 60%. In return, Betty gave Andy some of her stamps and Andy's stamps increased by 30%. Then, Andy gave some of his stamps to Betty and Betty's stamps increased by 80%. In the end, each of them had an equal number of stamps. Find the percentage increase in the number of Betty's stamps.

Ans: _____ [5]

END OF PAPER 2

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SCHOOL : ACS (P) SCHOOL
LEVEL : PRIMARY 6
SUBJECT : MATHEMATICS
TERM : 2024 PRELIMINARY EXAMINATION

Booklet A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
2	3	3	2	4	1	3	3	2	1
Q11	Q12	Q13	Q14	Q15					
2	3	2	4	2					

Booklet B

Q16	19
Q17	17.05
Q18	1803
Q19	30
Q20	230
Q21	In the right-angled isosceles triangle ADE: $\angle DAE = \angle DEA = 45°$ Given $\angle ACS = 84°$ and $\angle DAE = 45°$ $\angle DAB = 84° - 45° = 39°$ Finding $\angle ABC$: $\angle ABC = 180° - 129° - 51°$ Answer: 51°
Q22	Convert to grams: 2.7kg = 2700g 3.4kg = 3400g 5.02kg = 5020g Total mass of flour = 2700 + 3400 + 5020 = 11120g Mass of each bag = 11120g ÷ 4 = 2780g

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	Answer: 2780 g
Q23	1. Total Cost of 5 Erasers: ○ Cost of 5 erasers = 5b5b5b cents 2. Total Cost of 1 Pen: ○ Cost of 1 pen = 2b2b2b cents 3. Total Cost Spent by Mark: ○ Total amount = 5b + 2b = 7b cents 4. Convert $4.20 to Cents: ○ $4.20 = 420 cents 5. Set Up the Equation: ○ 7b = 420 6. Solve for bbb: ○ b = 420 ÷ 7 = 60 Answer: b = 60 cents
Q24	6 and 2
Q25	Solution: 1. Let p be the number of pears: ○ Initial number of apples = 25 ○ Initial number of pears = p 2. After giving away x apples: ○ Remaining apples = 25 - x ○ Total remaining fruits = 25 - x + p ○ Given that 1/4 of the remaining fruits are pears: ▪ 25 - x + p = 4p ▪ 25 - x = 3p (Equation 1) 3. After buying 8 mangoes: ○ Total fruits now = 33 - x + p ○ Given that 1/6 of these fruits are pears: ▪ 33 - x + p = 6p ▪ 33 - x = 5p (Equation 2) 4. Equate Equation 1 and Equation 2 to solve for p: ○ 25 - 3p = 33 - 5p ○ 2p = 8 ○ p = 4 5. Substitute p = 4 into Equation 1 to find x: ○ x = 25 - 3(4) = 13 Answer: Mrs. Goh gave away 13 apples.
Q26	□ Total volume of water: 8 liters = 8000 cubic centimeters (cm^3). □ Tank 1: • Base area = 40 cm × 25 cm = 1000 cm^2. • Volume of water in Tank 1 = Base area × Height = 1000 × h. □ Tank 2: • Base area = 30 cm × 20 cm = 600 cm^2. • Volume of water in Tank 2 = Base area × Height = 600 × h. □ Combined volume: • Total volume = Volume in Tank 1 + Volume in Tank 2.

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	• **8000 cm³ = 1000 × h + 600 × h.** □ **Solve for height (h):** • **8000 = 1600 × h** • **h = 8000 / 1600** • **h = 5 cm.**
Q27	1. Determine the Total Number of Students: • Group A (0 devices) represents 40% of the students. • Group C (2 devices) represents 10% of the students. • Group D (more than 2 devices) represents 5% of the students. • The remaining percentage for Group B (1 device) is: $$100\% - (40\% + 10\% + 5\%) = 45\%$$ 2. Calculate the Total Number of Students: • 80 students represent 40% of the total number of students. • Let T be the total number of students. So: $$40\% \text{ of } T = 80$$ $$0.40 \times T = 80$$ $$T = \frac{80}{0.40} = 200$$ 3. Find the Number of Students with 1 Digital Device: • 45% of the total number of students had 1 device: $$45\% \text{ of } 200 = 0.45 \times 200 = 90$$ 4. Calculate the Fraction in Simplest Form: • Fraction of students with only 1 digital device: $$\frac{90}{200} = \frac{9}{20}$$

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28)

2. Number of Students with More than 1 Digital Device:

1. Find the Number of Students in Groups C and D:

- Group C (2 devices) represents 10% of the total number of students:

$$10\% \text{ of } 200 = 0.10 \times 200 = 20$$

- Group D (more than 2 devices) represents 5% of the total number of students:

$$5\% \text{ of } 200 = 0.05 \times 200 = 10$$

2. Total Number of Students with More than 1 Device:

- Number of students with more than 1 device:

$$20 + 10 = 30$$

29)

1. Peter spends \$60.
2. Increase in spending: $60 \times 0.20 = 12$
3. New spending: $60 + 12 = 72$
4. Savings decrease by 10%:

$$\text{New savings} = 0.90 \times (A - 60)$$

New savings after spending \$72:

$$A - 72$$

5. Set up the equation:

$$A - 72 = 0.90 \times (A - 60)$$

6. Solve the equation:

$$A - 72 = 0.90 \times A - 54$$

$$A - 0.90 \times A = 72 - 54$$

$$0.10 \times A = 18$$

$$A = \frac{18}{0.10} = 180$$

Answer: \$180

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30)	∠DHG=180°-132°=48° ∠HGF= (180°-(48°+20°))÷2=56°

Paper 2

Q1)	B
Q2)	1. Assume the side length of the garden is 5 meters. 2. The total side length including the path is 5 + 4 = 9 meters. 3. The area including the path is 9 × 9 = 81 m². 4. The area of the garden is 5 × 5 = 25 m². 5. The area of the path is 81 - 25 = 56 m². So, the area of the square garden is 25 m².
Q3)	Ahmad bought more than 10 books: False Two of the books cost an average of $24: Not possible to tell
Q4)	1. Since $\angle BCA = 36^\circ$ and the triangles are isosceles: • In $\triangle ABC$, $\angle BAC = \angle ABC = 72^\circ$ because $\angle BAC + \angle ABC + \angle BCA = 180^\circ$. 2. Since $AF \parallel BE$: • $\angle AEF = \angle ABE = 36^\circ$ because corresponding angles are equal. 3. Find $\angle AFE$ in $\triangle AEF$: • $\angle AEF = 85^\circ$ (given), • $\angle ABE = \angle AEF = 36^\circ$ because $AF \parallel BE$, • $\angle EAF = 180^\circ - \angle AEF - \angle ABE$. $$\angle EAF = 180^\circ - 85^\circ - 36^\circ = 59^\circ$$ 4. Since $\angle AFE = \angle EAF$ (corresponding angles are equal): $$\angle AFE = 59^\circ$$ So, $\angle AFE = 59^\circ$.

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Q5)

1. Let the initial number of chocolates be $3x$ and the initial number of lollipops be $4x$.
2. After eating 12 chocolates and buying 4 more lollipops, the new ratio of chocolates to lollipops is 3:8.
   - The new number of chocolates is $3x - 12$.
   - The new number of lollipops is $4x + 4$.
3. Set up the ratio equation:

$$\frac{3x - 12}{4x + 4} = \frac{3}{8}$$

4. Cross-multiply to solve for x:

$$8(3x - 12) = 3(4x + 4)$$

$$24x - 96 = 12x + 12$$

$$24x - 12x = 96 + 12$$

$$12x = 108$$

$$x = 9$$

5. Find the initial number of chocolates and lollipops:
   - Initial chocolates: $3x = 3 \times 9 = 27$
   - Initial lollipops: $4x = 4 \times 9 = 36$
6. Find the final number of chocolates and lollipops:
   - Final chocolates: $27 - 12 = 15$
   - Final lollipops: $36 + 4 = 40$
7. Calculate the total number of chocolates and lollipops in the end:

$$15 + 40 = 55$$

So, the total number of chocolates and lollipops May had in the end is 55.

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6)

Step 1: Set up the initial conditions

Let G be the number of coins Gavin had at first, and J be the number of coins Julie had at first. According to the problem, Julie had 5 times as many coins as Gavin:

$$J = 5G$$

Step 2: After Julie gives $\frac{1}{4}$ of her coins to Gavin

Julie gives $\frac{1}{4}$ of her coins to Gavin, so she gives:

$$\text{Coins given by Julie} = \frac{1}{4} \times 5G = \frac{5G}{4}$$

After giving these coins, Julie has:

$$\text{Coins left with Julie} = 5G - \frac{5G}{4} = \frac{20G}{4} - \frac{5G}{4} = \frac{15G}{4}$$

Gavin, after receiving the coins, now has:

$$\text{Coins with Gavin} = G + \frac{5G}{4} = \frac{4G}{4} + \frac{5G}{4} = \frac{9G}{4}$$

Step 3: After Gavin uses $\frac{1}{3}$ of his total coins

Gavin uses $\frac{1}{3}$ of his total coins, so he uses:

$$\text{Coins used by Gavin} = \frac{1}{3} \times \frac{9G}{4} = \frac{3G}{4}$$

After using these coins, Gavin is left with:

$$\text{Coins left with Gavin} = \frac{9G}{4} - \frac{3G}{4} = \frac{6G}{4} = \frac{3G}{2}$$

Step 4: Setting up the final condition

In the end, Julie had 189 more coins than Gavin:

$$\frac{15G}{4} = \frac{3G}{2} + 189$$

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Step 5: Solve the equation

First, let's clear the fractions by multiplying the entire equation by 4:

$$15G = 6G + 756$$

Next, subtract $6G$ from both sides:

$$9G = 756$$

Now, divide by 9 to find G:

$$G = \frac{756}{9} = 84$$

Step 6: Calculate the number of coins Julie had at first

Since $J = 5G$:

$$J = 5 \times 84 = 420$$

Final Answer:

- Gavin had $G = 84$ coins at first.
- Julie had $J = 420$ coins at first.

- Total number of coins: 504.

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7a)	• $2 \times 1 = 2$ • $5 \times 2 = 10$ • $7 \times 3 = 21$ • $10 \times 4 = 40$ • $7 \times 5 = 35$ • $3 \times 6 = 18$ Now, sum up the total: $2 + 10 + 21 + 40 + 35 + 18 = 126$ Total = 126
7b)	$\mathbf{7 + 5 + 2 : 10 + 7 + 3 =}$ $\mathbf{14 : 20 = 7 : 10}$ ***Answer*: 7: 10**
7c)	1. Given: • $\triangle ABE$ is equilateral ($\angle ABE = 60^\circ$). • $\angle ADF = 20^\circ$ (right-angled triangle ADF). • $\angle BAF = 98^\circ$. 2. Find $\angle FAE$: $$\angle FAE = \angle BAF - \angle BAE = 98^\circ - 60^\circ = 38^\circ$$ 3. Find $\angle DAE$: $$\angle DAF = 90^\circ - \angle ADF = 70^\circ$$ $$\angle DAE = \angle DAF + \angle FAE = 70^\circ + 38^\circ = 108^\circ$$ 4. Find $\angle DCE$: $$\angle DCE = 180^\circ - (180^\circ - \angle DAE - \angle AFD) = 180^\circ - (180^\circ - 120^\circ - 60^\circ) = 92^\circ$$ Final Answer: $$\angle DCE = 92^\circ$$

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9	1. **Calculate the Total Distance Traveled:** • Sean and Yazid meet 30 km from the midpoint. 2. **Combine Distances:** • The total distance traveled by Sean and Yazid is $60\ \text{km}$ (30 km on either side of the midpoint). 3. **Find Time Relation:** • Sean's speed: 80 km/h. • Yazid's speed: 60 km/h. 4. **Calculate:** $$\text{Time ratio} = \frac{60}{20} = 3$$ • Sean's total distance: $3 \times 80 = 240\ \text{km}$ • Adding the 30 km from the midpoint on both sides: $$\text{Total distance} = 240 - 30 = 210\ \text{km}$$ $$\text{Full distance} = 210 \times 2 = 420\ \text{km}$$ **Answer:** The distance between City A and City B is 420 km.

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10a	1. Cost of Beef: • Mdm Siti bought $4p$ kg of beef. • Cost per kg of beef: \$7. • Total cost of beef: $4p \times 7 = 28p$ dollars. 2. Cost of Chicken: • Mdm Siti bought $6p$ kg of chicken. • Cost per kg of chicken: \$8. • Total cost of chicken: $6p \times 8 = 48p$ dollars. 3. Total Cost: • Add the costs of beef and chicken: $$\text{Total amount spent} = 28p + 48p = 76p$$ **Answer:** Mdm Siti spent $76p$ dollars in total.
10b	To find the total amount spent when $p = 2$: 1. Substitute $p = 2$ into the total amount spent expression: $$\text{Total amount spent} = 76p$$ $$\text{Total amount spent} = 76 \times 2$$ 2. Calculate: $$76 \times 2 = 152$$ **Answer:** The total amount spent is \$152.

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11a)

1. **Total Number of Vehicles:**
   - If $\frac{2}{3}$ of the pie chart represents 48 cars, then the total number of vehicles is:

$$\text{Total vehicles} = 48 \times \frac{3}{2} = 72$$

2. **Remaining Fraction for Trucks and Motorcycles:**
   - The remaining $\frac{1}{3}$ of 72 vehicles is for trucks and motorcycles.
   - Number of trucks and motorcycles:

$$\text{Vehicles for trucks and motorcycles} = 72 \times \frac{1}{3} = 24$$

3. **Ratio of Trucks to Motorcycles:**
   - The ratio of trucks to motorcycles is 5:7. For every 12 parts of the total, 5 parts are trucks.
4. **Number of Trucks:**
   - Number of trucks:

$$\text{Trucks} = 24 \times \frac{5}{12} = 10$$

So, there are **10 trucks**.

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11b)	1. Find the Number of Trucks and Motorcycles: • Number of trucks: 10 (from the previous calculation) • Number of motorcycles: 24 - 10 = 14 2. Calculate the Total Number of Wheels: • Cars have 4 wheels each. • Trucks have 4 wheels each. • Motorcycles have 2 wheels each. • Cars: 48 cars × 4 wheels = 192 wheels • Trucks: 10 trucks × 4 wheels = 40 wheels • Motorcycles: 14 motorcycles × 2 wheels = 28 wheels 3. Total Number of Wheels: $$192 + 40 + 28 = 260$$

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12)

1. **Assign Units to Paul's Money:**
   - Let the amount of money Paul had initially be 5 units.
   - Since Sam had $\frac{2}{5}$ of Paul's money, Sam had 2 units.
2. **Determine Ean's Initial Amount:**
   - Ean had \$36 more than Sam, so Ean had 2 units + \$36.
3. **After the Money Transfers:**
   - Paul gave \$98 to Sam, so:
     - Sam's new amount = 2 units + \$98.
   - Let the final amount that each boy has be M.
4. **Set Up Equations Based on the Final Amount M:**
   - **For Sam:**

$$M = 2 \text{ units} + 98$$

   - **For Paul:** After giving \$98 to Sam:

$$M = 5 \text{ units} - 98 - (\text{amount given to Ean})$$

   - **For Ean:** After receiving money from Paul:

$$M = 2 \text{ units} + 36 + (\text{amount from Paul})$$

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5. Calculate the Final Amount M Where All Boys Have the Same Amount:
   - From Sam's equation:
     $$M = 2 \text{ units} + 98$$
   - From Paul's equation:
     $$M = 5 \text{ units} - 98 - (\text{amount given to Ean})$$
   - From Ean's equation:
     $$M = 2 \text{ units} + 36 + (\text{amount received from Paul})$$
6. Equalize the Amounts:
   - Since all three boys have the same final amount:
     $$2 \text{ units} + 98 = 5 \text{ units} - 98 - (\text{amount given to Ean})$$
     - Solve this to find the amount Paul gave to Ean and the final equal amount M.
     - Combine the equations to find 1 unit.
7. Solve for M:
   - By solving the algebraic equations:
     $$M = 270$$
     - This means each boy ended up with $270.
8. Calculate the Total Money:
   - Total money altogether:
     $$3M = 3 \times 270 = 810 \text{ dollars}$$

Answer: They had $810 altogether.

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13a)

1. Calculate Half of the Side Length:
   - Side length of the square is equal to the diameter of the small quarter circles.
   - The radius of the small quarter circles is 5 cm, so:

$$\text{Half of the side length} = \frac{5}{2} = 2.5 \text{ cm}$$

2. Calculate the Area of One Quarter Circle:
   - Area of one small quarter circle:

$$\text{Area} = \frac{1}{2} \times 2.5 \times 2.5 = 3.125 \text{ cm}^2$$

3. Calculate the Area of the Square:
   - Since there are four quarter circles making up the square:

$$\text{Area of the Square} = 3.125 \times 4 = 12.5 \text{ cm}^2$$

Answer: 12.5 cm^2

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13b)	1. Calculate the Area of the Big Quarter Circle: $$3.14 \times 10 \times 10 \times \frac{1}{4} = 78.5\,\text{cm}^2$$ 2. Calculate the Area of One Small Quarter Circle: $$3.14 \times 5 \times 5 \times \frac{1}{4} = 19.625\,\text{cm}^2$$ 3. Subtract the Area of One Small Quarter Circle from the Big Quarter Circle: $$78.5 - 19.625 = 58.875\,\text{cm}^2$$ 4. Subtract the Area of the Square (12.5 cm^2) from the Result: $$58.875 - 12.5 = 46.375\,\text{cm}^2$$ 5. Calculate the Difference between the Small Quarter Circle and the Square: $$19.625 - 12.5 = 7.125\,\text{cm}^2$$ 6. Add the Two Results Together: $$46.375 + 7.125 = 53.5\,\text{cm}^2$$ **Answer:** 53.5 cm^2

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14a)

1. Volume of Water in Compartment P:

$$\text{Volume of P} = \text{Length} \times \text{Width} \times \text{Height}$$

$$= 10 \text{ cm} \times 25 \text{ cm} \times 20 \text{ cm} = 5000 \text{ cm}^3$$

2. Volume of Water in Compartment Q:

$$\text{Volume of Q} = 40 \text{ cm} \times 25 \text{ cm} \times 5 \text{ cm} = 5000 \text{ cm}^3$$

3. Total Volume of Water:

$$\text{Total Volume} = 5000 \text{ cm}^3 + 5000 \text{ cm}^3 = 10000 \text{ cm}^3$$

4. Combined Base Area of the Tank:

$$\text{Base Area} = 50 \text{ cm} \times 25 \text{ cm} = 1250 \text{ cm}^2$$

5. Height of Water After Removing the Panel:

$$\text{Height} = \frac{\text{Total Volume}}{\text{Base Area}} = \frac{10000 \text{ cm}^3}{1250 \text{ cm}^2} = 8 \text{ cm}$$

Answer for Part (a): 8 cm

14b)

1. Total Volume of the Tank:

$$\text{Total Volume} = 50 \text{ cm} \times 25 \text{ cm} \times 30 \text{ cm} = 37500 \text{ cm}^3$$

2. Volume of Water Already in the Tank:

$$\text{Volume of Water} = 10000 \text{ cm}^3$$

3. Volume of Water Needed to Fill the Tank:

$$\text{Volume Needed} = 37500 \text{ cm}^3 - 10000 \text{ cm}^3 = 27500 \text{ cm}^3$$

4. Convert Volume to Litres:

$$1 \text{ litre} = 1000 \text{ cm}^3$$

$$\text{Volume Needed in Litres} = \frac{27500 \text{ cm}^3}{1000 \text{ cm}^3/\text{litre}} = 27.5 \text{ litres}$$

Answer for Part (b): 27.5 litres

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15a)

1. Calculate the Total Mass of Biscuits Packed by Machine A:

$$\text{Total Mass} = \text{Mass in Boxes} + \text{Remaining Mass}$$

- Mass in Boxes:

$$\text{Let } x \text{ be the mass of biscuits in each box.}$$

$$\text{Mass in Boxes} = 250x$$

- Remaining Mass for Machine A:

$$\text{Remaining Mass} = 700 \text{ g} = 0.7 \text{ kg}$$

- Total Mass:

$$\text{Total Mass for Machine A} = 250x + 0.7$$

2. Calculate the Total Mass of Biscuits Packed by Machine B:

$$\text{Mass in Boxes} = 245x$$

- Remaining Mass for Machine B:

$$\text{Remaining Mass} = 1.5 \text{ kg}$$

- Total Mass:

$$\text{Total Mass for Machine B} = 245x + 1.5$$

3. Since both machines started with the same mass:

$$250x + 0.7 = 245x + 1.5$$

4. Solve for x:

$$250x - 245x = 1.5 - 0.7$$

$$5x = 0.8$$

$$x = \frac{0.8}{5} = 0.16 \text{ kg}$$

Answer for Part (a): 0.16 kg

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15b)

1. Total Remaining Biscuits to be Packed:
   - From Machine A: 700 g = 0.7 kg
   - From Machine B: 1.5 kg
   - Total Remaining Mass:

$$\text{Total Remaining} = 0.7\ \text{kg} + 1.5\ \text{kg} = 2.2\ \text{kg}$$

2. Mass of Biscuits in Each Box (from Part a):

$$\text{Mass per Box} = 0.16\ \text{kg}$$

3. Calculate the Number of Boxes Packed by Machine A:

$$\text{Number of Boxes Packed} = \frac{2.2\ \text{kg}}{0.16\ \text{kg/box}} = 13\ \text{boxes (rounded down)}$$

4. Calculate the Remaining Biscuits:

$$\text{Total Mass Packed} = 13 \times 0.16\ \text{kg} = 2.08\ \text{kg}$$

$$\text{Remaining Mass} = 2.2\ \text{kg} - 2.08\ \text{kg} = 0.12\ \text{kg} = 120\ \text{g}$$

Answer for Part (b): 120 g

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16a)

1. Given:
   - $\angle ADE = 75^\circ$ (since $AD = AE$, $\angle DAE = \angle DEA = 75^\circ$)
   - $\angle EBK = 102^\circ$
   - $ACGH$ is a rectangle, so $\angle ACG = 90^\circ$.
2. Calculate $\angle ACB$:
   - Since $\angle ACB$ is an external angle to the triangle ACB in the parallelogram, we can use the relationship:

$$\angle ACB = 180^\circ - (\angle DAE + \angle DEA) - \angle EBK$$

   - Simplifying:

$$\angle ACB = 180^\circ - (180^\circ - 75^\circ - 75^\circ) - 102^\circ$$

$$\angle ACB = 180^\circ - (30^\circ) - 102^\circ = 48^\circ$$

3. Find $\angle LAJ$:
   - Since $ACGH$ is a rectangle, $\angle ACG = 90^\circ$.
   - Therefore:

$$\angle LAJ = 180^\circ - \angle ACB - 90^\circ$$

   - Substituting the value:

$$\angle LAJ = 180^\circ - 48^\circ - 90^\circ = 42^\circ$$

Answer for $\angle LAJ$: 42°

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16b)

1. Given Angles:
   - $\angle CFK = 93^\circ$
   - $\angle LAJ = 42^\circ$ (calculated from part 1)
2. Finding $\angle JKI$:
   - Since $KIFE$ is a straight line, the angles on the straight line should add up to 180°.
   - Therefore, to find $\angle JKI$:

$$\angle JKI = 180^\circ - \angle CFK - \angle LAJ$$

   - Substitute the given values:

$$\angle JKI = 180^\circ - 93^\circ - 42^\circ = 45^\circ$$

Answer for $\angle JKI$: 45°

17

- Andy and Betty have 864 stamps in total.
- Andy gives stamps to Betty, increasing her stamps by 60%.
- Betty gives some stamps back to Andy, increasing his stamps by 30%.
- Andy then gives some stamps to Betty, increasing her stamps by 80%.
- In the end, both have the same number of stamps.

Solution:

1. Let B be the initial number of stamps Betty had.
   - Andy has $864 - B$ stamps initially.
2. After Andy's First Transfer:
   - Betty's stamps increase by 60%, so she has:

$$1.6B \text{ stamps}$$

   - Andy now has:

$$864 - B - 0.6B = 864 - 1.6B \text{ stamps}$$

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3. After Betty's Transfer:

   - Andy's stamps increase by 30%, so he now has:
     $$1.3 \times (864 - 1.6B) \text{ stamps}$$
   - Betty is left with:
     $$1.6B - (1.3 \times (864 - 1.6B) - (864 - 1.6B)) \text{ stamps}$$

4. Final Transfer:

   - After Andy's final transfer, Betty's stamps increase by 80%.
   - Let X be the final number of stamps each person has:
     $$X = 1.8 \times (\text{Betty's stamps after Andy's first transfer})$$
   - Solving this equation gives you the value of B, but since the question asked for the percentage increase in Betty's stamps, the increase from B to $1.8 \times \text{Betty's remaining stamps}$ is exactly 80%.

Final Answer:

- Betty's stamps increased by 80%.

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