NANYANG PRIMARY SCHOOL

PRELIMINARY EXAMINATION 2024

PRIMARY 6

MATHEMATICS PAPER 1 (BOOKLET A)

Total Duration for Booklets A and B: 1 hour

Additional materials: Optical Answer Sheet (OAS)

INSTRUCTIONS TO PUPILS

1. Do not turn over this page until you are told to do so.
2. Follow all instructions carefully.
3. Answer all questions.
4. Shade your answers in the Optical Answer Sheet (OAS) provided.
5. The use of calculators is **NOT** allowed.

Name: _____ ( )

Class: Primary 6 ( )

Questions 1 to 10 carry 1 mark each. Questions 11 to 15 carry 2 marks each. For each question, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and shade your answer on the Optical Answer Sheet. (20 marks)

---

1 Round 153 498 to the nearest thousand.

(1) 150 000

(2) 153 000

(3) 154 000

(4) 160 000

2 In 20.176, which digit is in the tenths place?

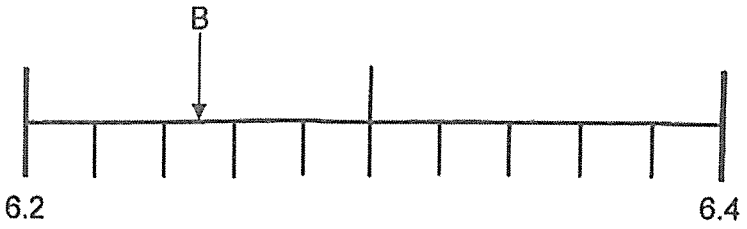
(1) 1

(2) 2

(3) 6

(4) 7

3 The figure below shows a number line. Which of the following is closest to the reading of B?



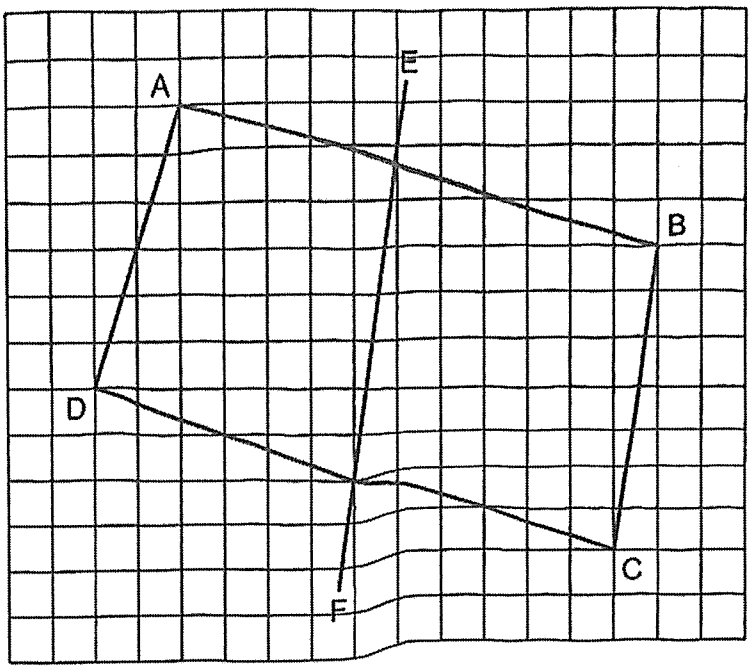
(1) 6.22

(2) 6.23

(3) 6.25

(4) 6.26

4 Which two lines in the square grid below are perpendicular to each other?



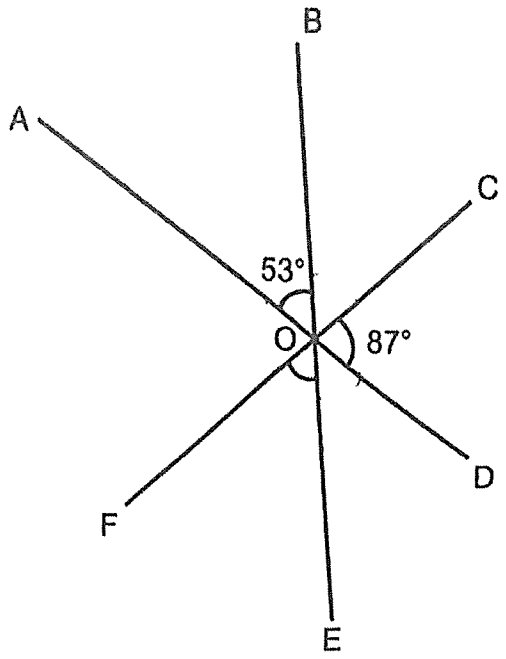
(1) BC and EF

(2) AB and AD

(3) AB and BC

(4) AD and DC

5 In the figure below, AOD, BOE and COF are straight lines. $\angle AOB = 53°$ and $\angle COD = 87°$. Find $\angle EOF$



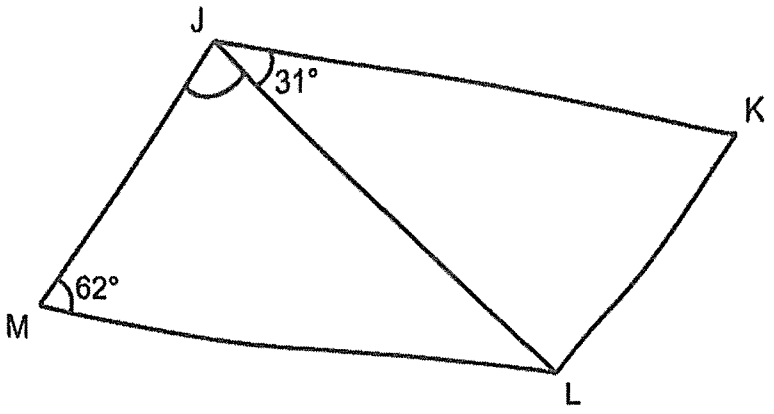
(1) 37°

(2) 40°

(3) 50°

(4) 53°

6 JKLM is a parallelogram. $\angle KJL = 31°$ and $\angle JML = 62°$. Find $\angle MJL$.



(1) 31°

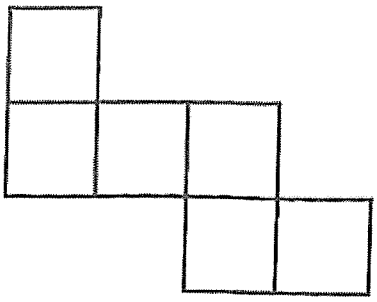
(2) 59°

(3) 87°

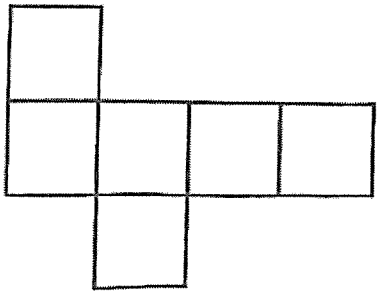
(4) 93°

7 Which of the following is not a net of a cube?

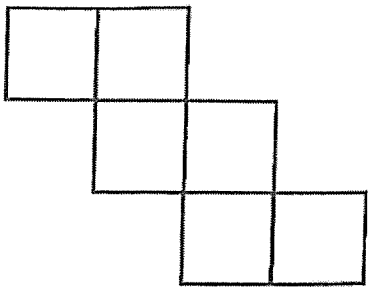
(1)



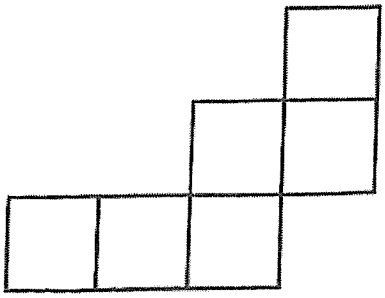
(2)



(3)



(4)



8 The table below shows the number of pastries sold by Mina over 3 days.

Day	Number of Pastries Sold
Monday	x
Tuesday	$x + 6$
Wednesday	64

Mina sold a total of 102 pastries on Tuesday and Wednesday. How many pastries did she sell on Monday?

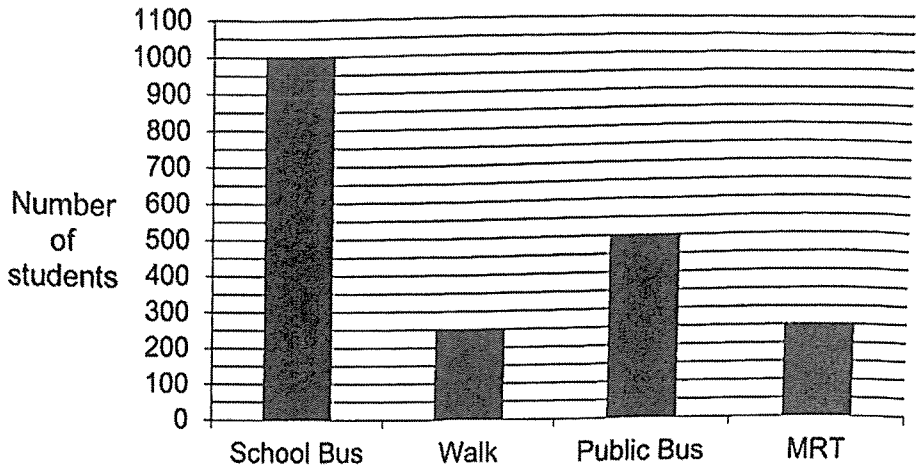
(1) 32

(2) 38

(3) 44

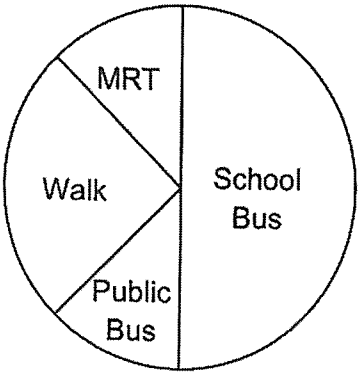
(4) 48

9 The bar graph below shows the number of students who travel to school using different modes of transport.

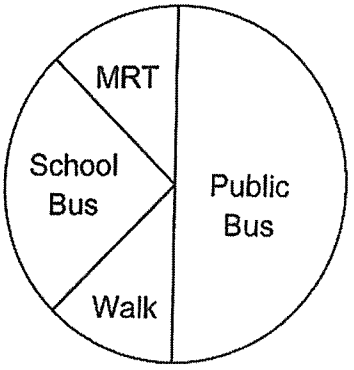


Which pie chart represents the data correctly?

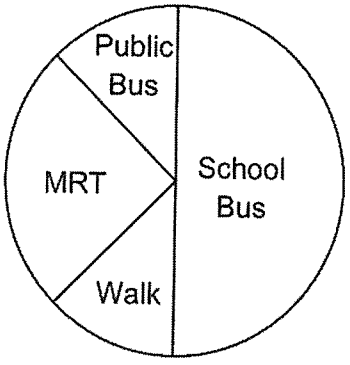
(1)



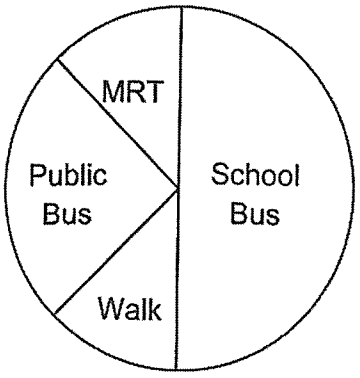
(2)



(3)



(4)



10 Which of the following is likely the height of a P6 classroom in Nanyang Primary School?

(1) 35 m

(2) 350 m

(3) 35 cm

(4) 350 cm

11 Arrange the following fractions from the smallest to the largest.

$$2\frac{2}{7}, \quad \frac{8}{3}, \quad \frac{9}{4}, \quad 2\frac{2}{5}$$

	Smallest			Largest
(1)	$2\frac{2}{7}$,	$2\frac{2}{5}$,	$\frac{9}{4}$,	$\frac{8}{3}$
(2)	$\frac{9}{4}$,	$2\frac{2}{7}$,	$\frac{8}{3}$,	$2\frac{2}{5}$
(3)	$\frac{9}{4}$,	$2\frac{2}{7}$,	$2\frac{2}{5}$,	$\frac{8}{3}$
(4)	$2\frac{2}{7}$,	$\frac{9}{4}$,	$2\frac{2}{5}$,	$\frac{8}{3}$

12 At first, Hang Seng and Ishmael were facing the same direction. Hang Seng turned 225° anti-clockwise to face North and Ishmael turned 90° clockwise. Which direction did Ishmael face in the end?

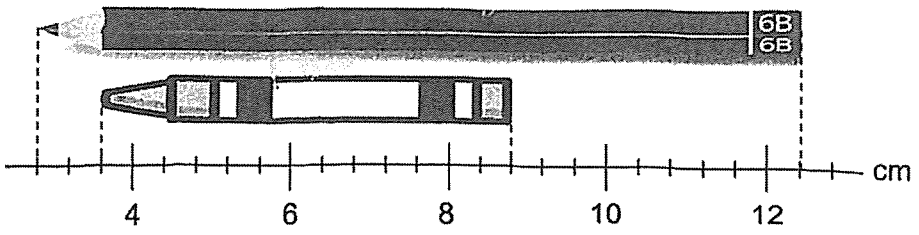
(1) North-East

(2) North-West

(3) South-East

(4) South-West

13 Find the total length of the crayon and the pencil.



(1) 13.4 cm

(2) 14.4 cm

(3) 14.8 cm

(4) 21.2 cm

14 In a camp, the number of boys is $\frac{4}{5}$ of the number of girls. The number of children is $\frac{2}{5}$ of the number of adults. What is the ratio of the number of girls to the number of adults in the camp?

(1) 1 : 9

(2) 9 : 1

(3) 2 : 9

(4) 9 : 2

15 The first 20 numbers in a pattern are shown below. What is the digit in the ones place of the 294th number?

11, 13, 16, 18, 19, 20, 21, 23, 26, 28, 29, 30, 31, 33, 36, 38, 39, 40, 41, 43 ..
1st 20th

(1) 1

(2) 0

(3) 8

(4) 9

NANYANG PRIMARY SCHOOL

PRELIMINARY EXAMINATION 2024

PRIMARY 6

MATHEMATICS PAPER 1 (BOOKLET B)

Total Duration for Booklets A and B: 1 hour

INSTRUCTIONS TO PUPILS

1. Do not turn over this page until you are told to do so.
2. Follow all instructions carefully.
3. Answer all questions.
4. Write your answers in this booklet.
5. The use of calculators is **NOT** allowed.

Name: _____ ( )

Class: Primary 6 ( )

Booklet B	/ 25

Please sign and return the examination paper the next day. Any queries should be raised at the same time when returning paper.

Questions **16** to **20** carry 1 mark each. Write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (5 marks)

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16 Jing Xuan had 63 pencils. She sold $\frac{2}{3}$ of her pencils. How many pencils did she sell?

Ans: _____

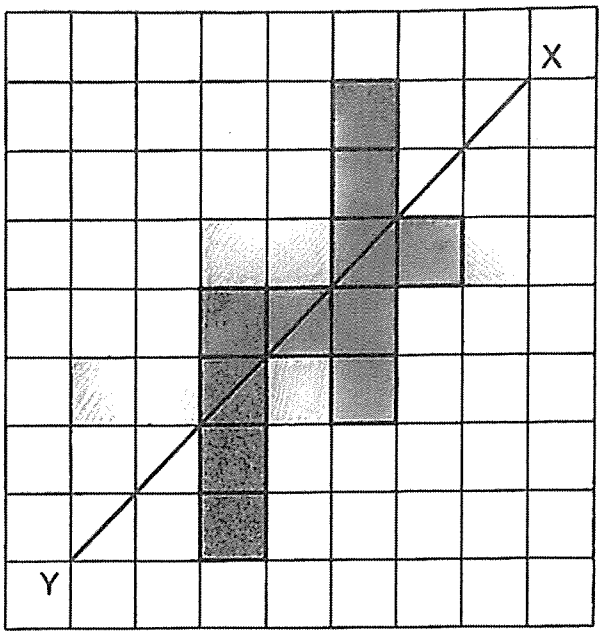
---

17 Express 9 kg 28 g in kilograms.

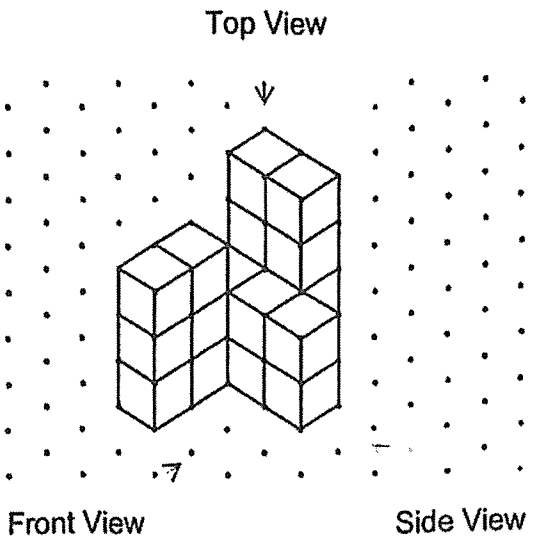
Ans: _____ kg

---

18 The figure below shows 11 squares. Shade the least number of squares such that line XY is the line of symmetry of the figure.

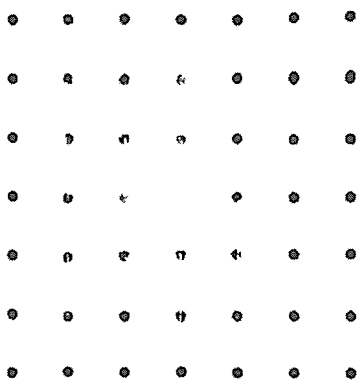


19 The solid below is made up of 20 unit cubes.



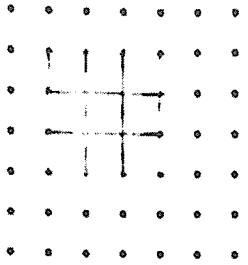
Draw the front view of the solid on the grid below.

Front View

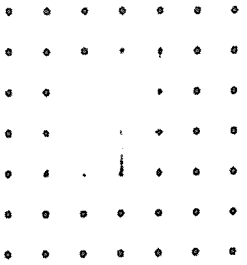


20 Below shows the front view, side view and top view of a solid built using unit cubes. What is the smallest number of unit cubes that must be added to the solid to make it a cube?

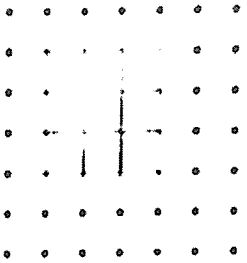
Front View



Side View



Top View



Ans: _____

Questions **21** to **30** carry 2 marks each. Show your working clearly and write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (20 marks)

---

21 Write down all the common multiples of 6 and 8 that are less than 70.

Ans: _____

---

22 A notebook costs \$2.65 and a pencil costs \$0.90.

(a) Find the total cost of one such notebook and one such pencil.

Ans: (a) \$_____

(b) Mrs Chia bought 200 such notebooks and 200 such pencils. How much did she pay altogether?

Ans: (b) \$_____

---

23 Bob participated in a competition that lasted 4 h 50 min. After the competition, he waited 35 min for his mother to fetch him. His mother fetched him at 4.15 p.m. What time did Bob's competition start?

Ans: _____

---

24 Faizal had 50 eggs. He sold all his eggs. What was the percentage decrease in the number of eggs he had?

Ans: _____%

---

25 Sarah uses the same amount of flour to bake each cake. She uses 876 g of flour to bake 6 cakes. How much flour is needed to make 8 such cakes?

Ans: _____ g

---

26 Gerald had $\frac{4}{5}$ ℓ of milk at first. He drank $\frac{1}{4}$ ℓ of milk in the morning and $\frac{1}{8}$ ℓ of milk in the afternoon. How much milk did Gerald have left?

Ans: _____ ℓ

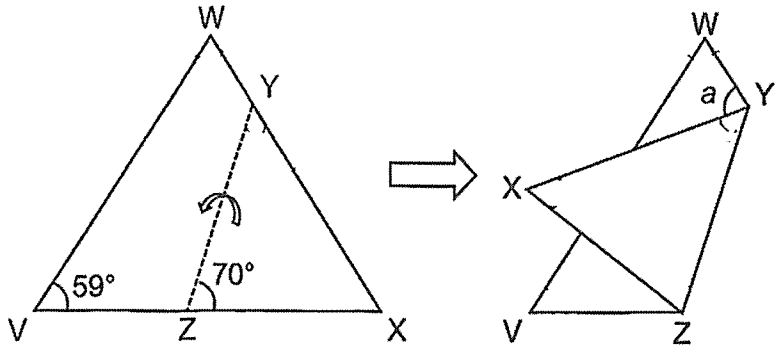
---

27 Hani had a roll of ribbon which was 4 m in length. She cut the ribbon into smaller pieces, each measuring $\frac{9}{10}$ m. She gave her sister the greatest number of such smaller pieces she could cut from the roll. How much ribbon did Hani have left?

Ans: _____ m

---

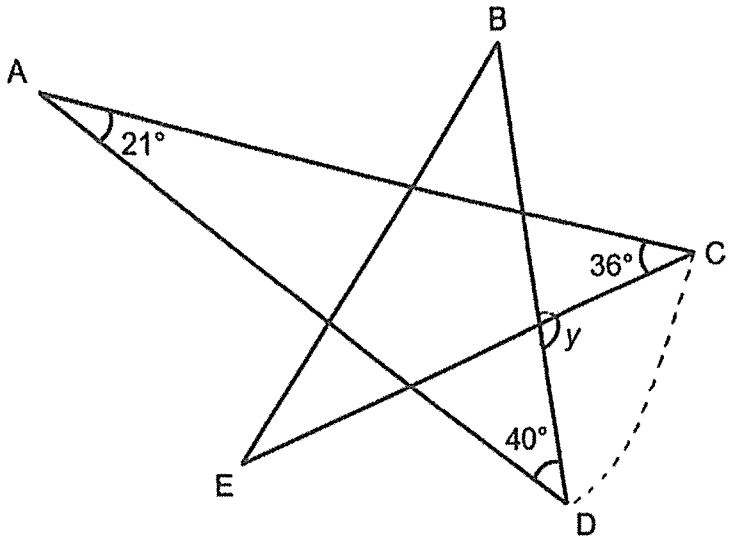
28 Kelly has a triangular piece of paper VWX with VW = WX. VZX and WYX are straight lines. ∠WVX = 59° and ∠XZY = 70°. She folded it along the line YZ as shown below. Find ∠*a*



Ans: _____ °

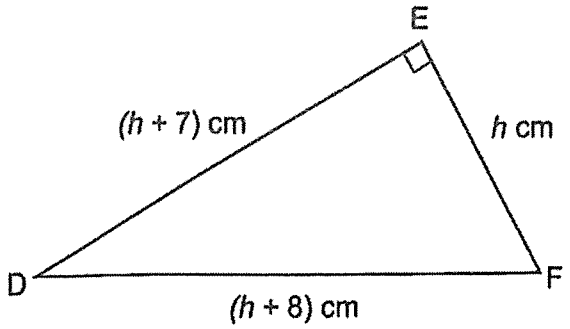
---

29 The figure below is formed by five straight lines, AC, AD, BD, BE and CE. $\angle CAD = 21°$, $\angle ACE = 36°$ and $\angle ADB = 40°$. Find $\angle y$.



Ans: _____ °

30 Triangle DEE is a right-angled triangle. The lengths of its sides are h cm, $(h + 7)$ cm and $(h + 8)$ cm. What is the area of triangle DEF if $h = 5$?



Ans: _____ cm^2

End of Paper

NANYANG PRIMARY SCHOOL

PRELIMINARY EXAMINATION 2024

PRIMARY 6

MATHEMATICS PAPER 2

Duration: 1 hour 30 minutes

INSTRUCTIONS TO PUPILS

1. Do not turn over this page until you are told to do so.
2. Follow all instructions carefully.
3. Answer all questions.
4. Write your answers in this booklet.
5. The use of an approved calculator is allowed.

Name: _____ ( )

Class: Primary 6 ( )

Parent's Signature: _____

Booklet A	**/ 20**
Booklet B	**/ 25**
Paper 2	**/ 55**
Total	**/ 100**

Please sign and return the examination paper the next day. Any queries should be raised at the same time when returning paper.

Questions 1 to 5 carry 2 marks each. Show your working clearly and write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (10 marks)

Abby has m cookies. Benson has 5 times as many cookies as Abby. Charlie has 4 more cookies than Benson. Abby, Benson and Charlie have 59 cookies altogether. How many cookies does Abby have?

Ans: _____

---

2 A printing machine prints 240 pages in $\frac{1}{6}$ h. How many pages does it print in 3.5 h?

Ans: _____

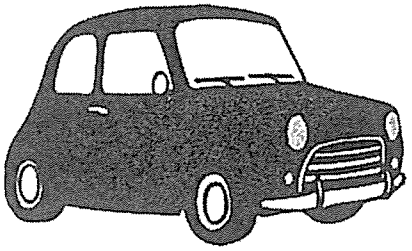
---

3 The average of a set of 7 numbers is 7. A number is added to the set and the average becomes 10. What is the number?

Ans: _____

---

4 What is the price of the car after adding 9% GST?

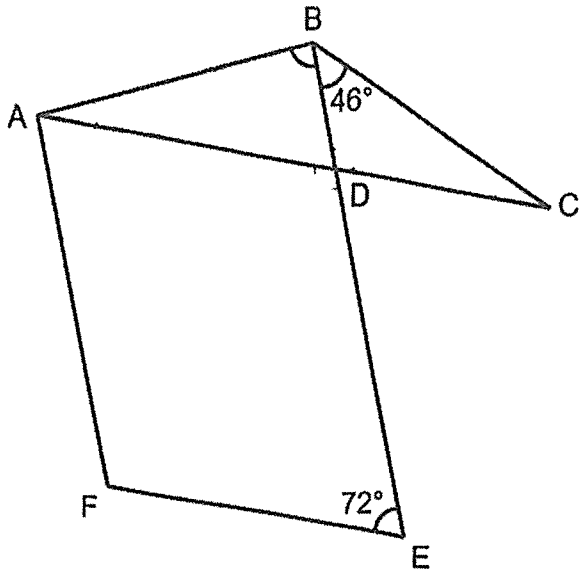


$188 000
(Price Before GST)

Ans: $_____

---

5 In the figure below, ABC is an isosceles triangle and AB = BC ADEF is a parallelogram. $\angle CBD = 46°$ and $\angle DEF = 72°$ BDE is a straight line. Find $\angle ABD$.

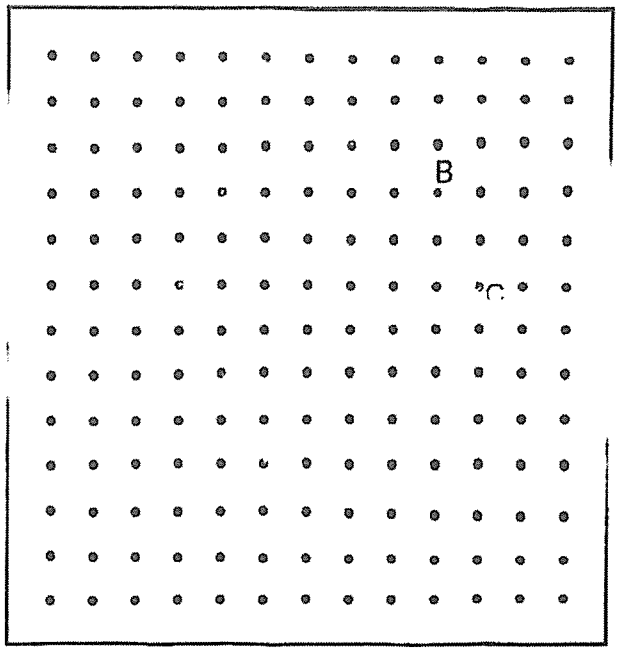


Ans: _____ °

For questions 6 to 17, show your working clearly and write your answers in the spaces provided. The number of marks available is shown in brackets [ ] at the end of each question or part-question. (45 marks)

---

6 In the square grid below, AB and BC are straight lines.



(a) By joining the dots on the grid with straight lines, draw a trapezium ABCD such that AD is parallel to BC and AD is twice as long as BC.

[1]

(b) By joining the dots on the grid with straight lines, draw a triangle ABE such that AE is perpendicular to BE and AE = BE. Triangle ABE does not overlap with trapezium ABCD.

[1]

(c) Find the ratio of the area of trapezium ABCD to the area of triangle ABE. Express the answer in its simplest form.

Ans: _____ [1]

A baker had some tarts and cookies. He packed the tarts in boxes of 6 and the cookies in boxes of 10. He sold each box of tarts for $28.80 and each box of cookies for $22.20. He sold 4 times as many boxes of tarts as boxes of cookies. He earned a total of $2198.40 from the sale of all the boxes of tarts and boxes of cookies. How many tarts did he sell?

Ans: _____ [3]

8 At first, Wei Liang had 360 more stickers than Vikram. Wei Liang gave $\frac{3}{8}$ of his stickers to Sue and Vikram gave $\frac{1}{4}$ of his stickers to Sue. In the end, Wei Liang had 159 more stickers than Vikram. How many stickers did Vikram have at first?

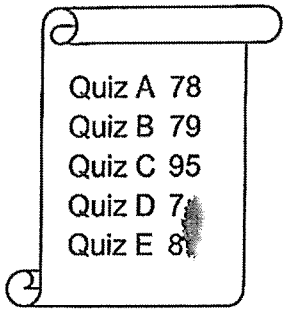
Ans: _____ [3]

9 The table below shows the type of medals to be awarded for a Mathematics competition.

Type of Medals	Gold	Silver	Bronze
Average of the best 4 quizzes' score	85 to 100	70 to 84	50 to 69

Every participant has to take part in a total of 5 quizzes. A medal will be awarded using the average of the best 4 quizzes' score.

Part of Tim's score sheet is smudged and the scores for the first 3 quizzes are shown below.



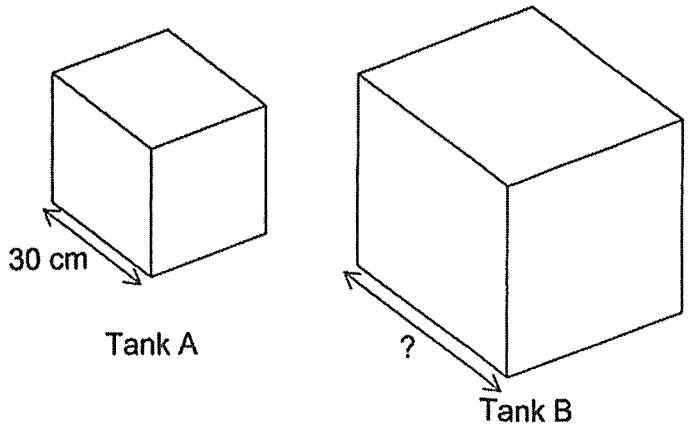
Given all his scores are whole numbers, what is the lowest possible score Tim must get in Quiz E to get a Gold medal?

Ans: _____ [3]

10 At 09 00, Peter travelled from City A to City B at a constant speed of 80 km/h. Half an hour later, Timothy travelled from City A to City B at a constant speed along the same route. After Timothy travelled 240 km, he caught up with Peter. Timothy took 5 hours to travel from City A to City B. Find the distance between City A and City B.

Ans: _____ [3]

11 Tank A and Tank B are cubical tanks. Tank A has a length of 30 cm. Tank A is completely filled with water and Tank B is empty. After $\frac{2}{5}$ of the water from Tank A is poured into Tank B, the ratio of the height of water in Tank A to that of Tank B is 8 : 3.



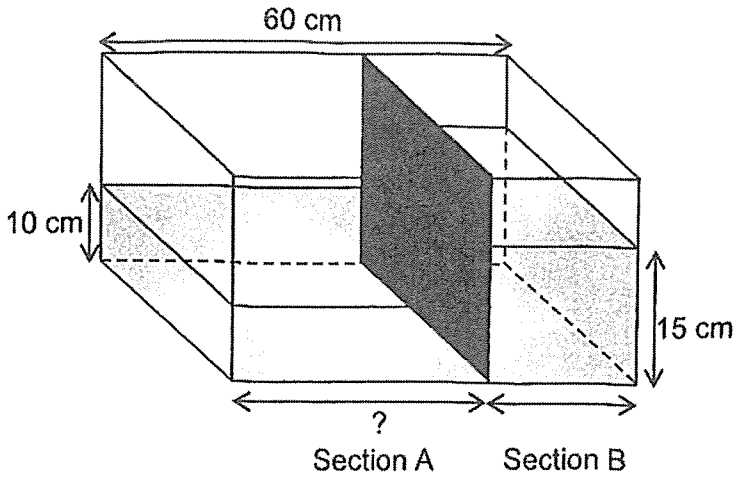
(a) Find the amount of water poured from Tank A to Tank B.

Ans: (a) _____ [1]

(b) Find the length of Tank B.

Ans: (b) _____ [3]

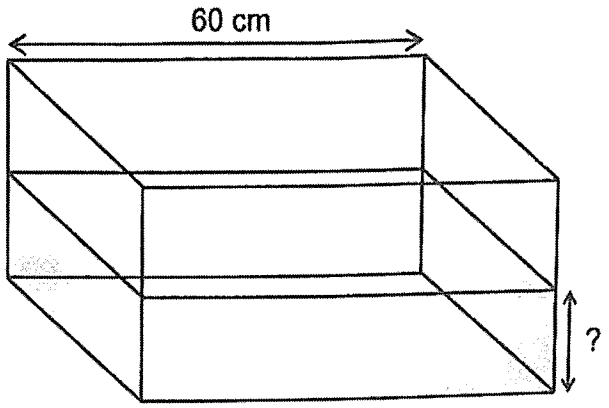
12 The length of a rectangular tank is 60 cm as shown below. A divider is put into the rectangular tank to create 2 sections, Section A and Section B. An equal amount of water is poured into Section A and Section B. The height of the water in Section A is 10 cm and the height of the water in Section B is 15 cm.



(a) What is the length of Section A?

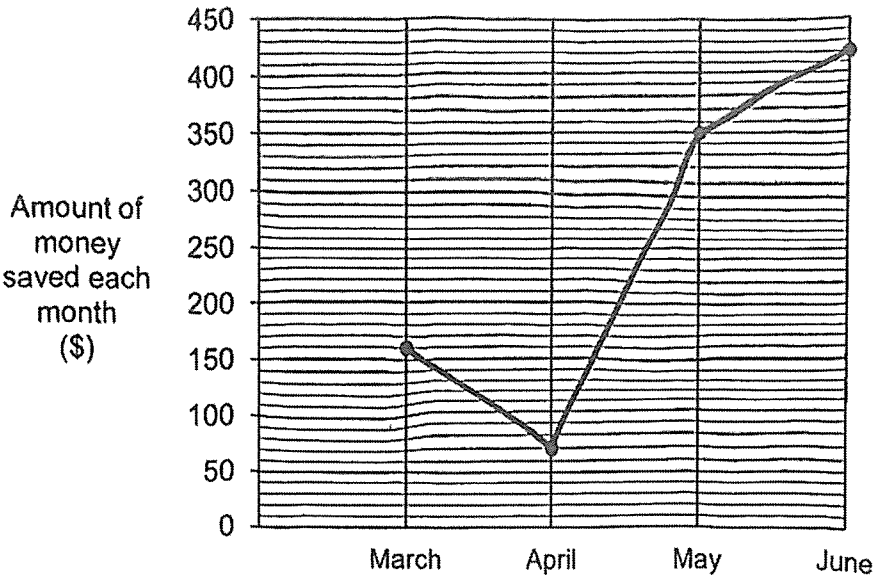
Ans: (a) _____ [2]

(b) The divider is removed from the rectangular tank. What is the height of the water in the tank now?



Ans: (b) _____ [2]

13 The line graph shows the amount of money that Raj saved each month from March to June.



(a) How much more did he save in May than April?

Ans: (a) _____ [1]

(b) What was the percentage increase in his savings from May to June?

Ans: (b) _____ [1]

(c) The amount of money Raj saved in July was $\frac{1}{5}$ of the total amount of money he saved from March to July. How much did he save in July?

Ans: (c) _____ [2]

14 David and Edmond had some stamps at first. The ratio of the number of stamps David had to that of Edmond was 1 : 4. David gave $\frac{1}{3}$ of his stamps to Edmond. After that, Edmond then gave $\frac{1}{2}$ of his stamps to David. David had 170 stamps in the end.

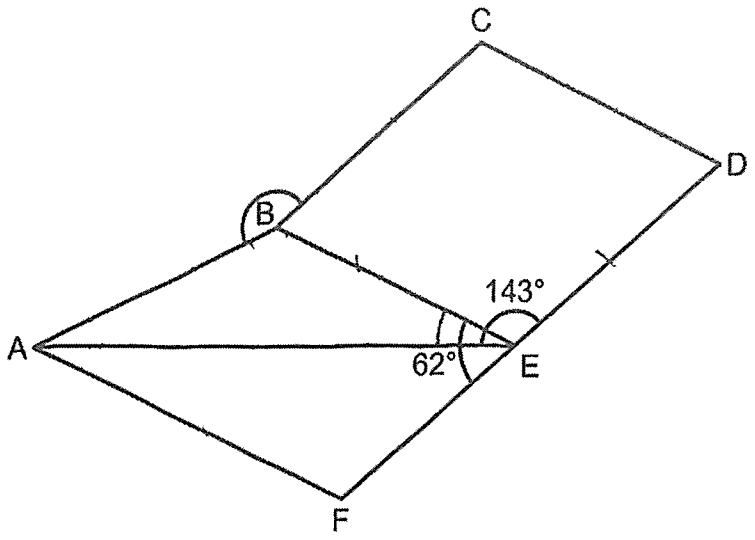
(a) How many stamps did David have at first?

Ans: (a) _____ [2]

(b) How many stamps did Edmond have in the end?

Ans: (b) _____ [2]

15 In the figure below, BCDE is a rhombus. DEF is a straight line. AF, BE and CD are parallel to each other. AB = BE, $\angle BEF = 62°$ and $\angle AED = 143°$.



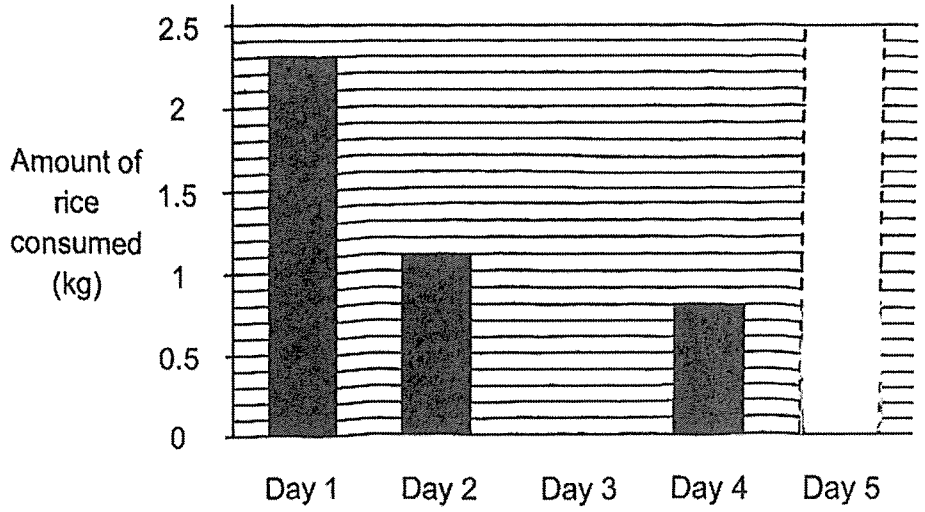
(a) Find $\angle AEB$.

Ans: (a) _____ [2]

(b) Find $\angle ABC$.

Ans: (b) _____ [2]

16 The Tan family finished 5 kg of rice in 5 days.
The graph below shows the amount of rice consumed by the Tan family from Day 1 to Day 5. The bar that shows the amount of rice consumed on Day 5 is not drawn.



(a) No rice was consumed on Day 3. Draw the bar for the amount of rice consumed by the Tan family on Day 5. [1]

(b) What fraction of the 5 kg of rice was consumed on Day 1?

Ans: (b) _____ [1]

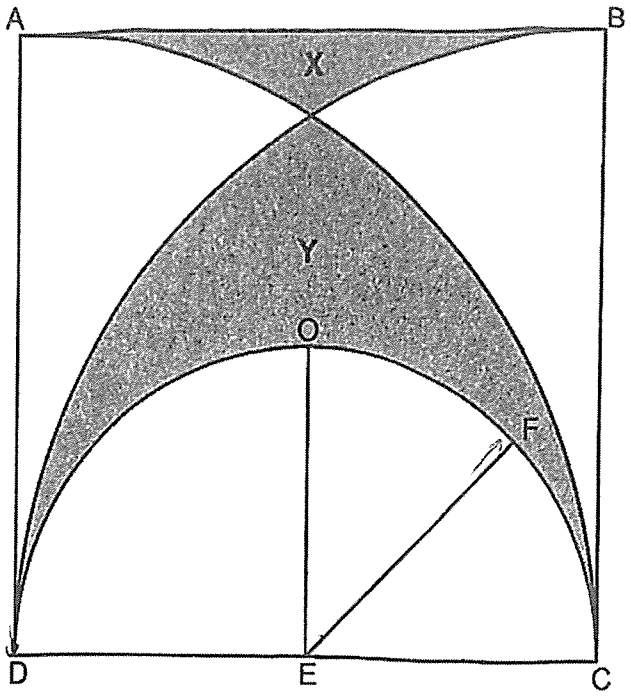
(c) 200 g of rice filled 1 cup. How many of such cups of rice were consumed in all by the end of Day 4?

Ans: (c) _____ [1]

(d) The average amount of rice consumed from Day 1 to Day 7 was 0.9 kg. Write down 1 possible set of values for the amount of rice consumed on Day 6 and Day 7.

Ans: (d) _____ , _____ [2]

17 The figure below is made up of a square ABCD, a semicircle DOC and 2 overlapping quarter circles DCB and ACD. DE = EC, F is a point on arc DOC, OE is a straight line and the length of EF is 50 cm.
(Take $\pi = 3.14$)



(a) Find the area of the semicircle DOC.

Ans: (a) _____ [2]

(b) Find the difference between area X and area Y.

Ans: (b) _____ [3]

End of Paper

Questions 1 to 10 carry 1 mark each. Questions 11 to 15 carry 2 marks each. For each question, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and shade your answer on the Optical Answer Sheet. (20 marks)

1 Round 153 498 to the nearest thousand.

round down

153 498 ≈ 153 000

(1) 150 000

(2) 153 000 ✓

(3) 154 000

(4) 160 000

(2)

2 In 20.176, which digit is in the tenths place?

(1) 1 ✓

(2) 2

(3) 6

(4) 7

(1)

3 The figure below shows a number line. Which of the following is closest to the reading of B?

10 gaps → 0.2

1 gap → 0.2 ÷ 10

= 0.02

(1) 6.22

(2) 6.23

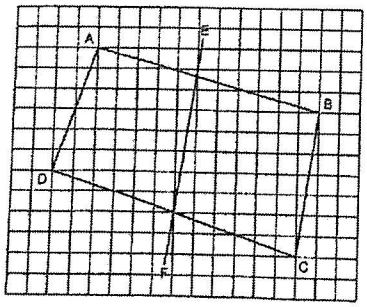
(3) 6.25 ✓

(4) 6.26

B is approximately halfway between 6.24 and 6.26. Hence, it should be closest to 6.25.

(3)

4 Which two lines in the square grid below are perpendicular to each other?



(1) BC and EF

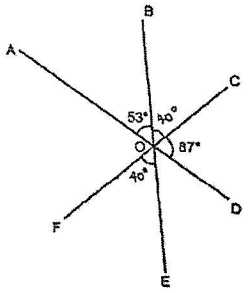
(2) AB and AD

(3) AB and BC

(4) AD and DC ✓

(4)

5 In the figure below, AOD, BOE and COF are straight lines. ∠AOB = 53° and ∠COD = 87°. Find ∠EOF.



(1) 37°

(2) 40° ✓

(3) 50°

(4) 53°

∠BOC = 180° − 53° − 87°

= 40°

∠EOF = ∠BOC = 40° (vertically opposite angles)

(2)

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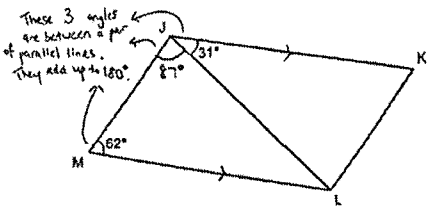
6 JKLM is a parallelogram. $\angle KJL = 31°$ and $\angle JML = 62°$. Find $\angle MJL$.



$\angle MJL = 180° - 62° - 31°$
$= 87°$

(1) 31°

(2) 59°

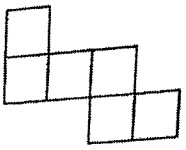
(3) 87° ✓

(4) 93°

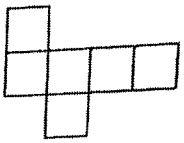
(3)

7 Which of the following is not a net of a cube?

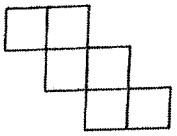
(1)



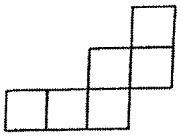
(2)



(3)



(4)



✓ (4)

8 The table below shows the number of pastries sold by Mina over 3 days.

Day	Number of Pastries Sold
Monday	x
Tuesday	x + 6
Wednesday	64

Mina sold a total of 102 pastries on Tuesday and Wednesday. How many pastries did she sell on Monday?

(1) 32 ✓

(2) 38

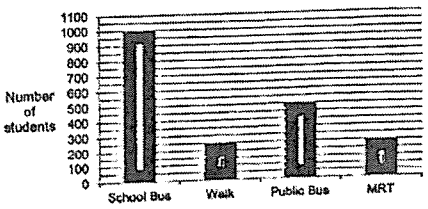
(3) 44

(4) 48

$(x+6) + 64 = 102$
$x + 70 = 102$
$x = 102 - 70$
$= 32$

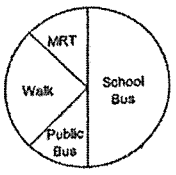
(1)

9 The bar graph below shows the number of students who travel to school using different modes of transport.

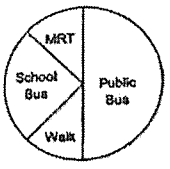


Which pie chart represents the data correctly?

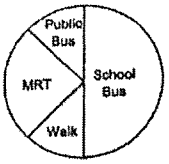
(1)



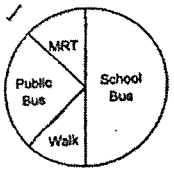
(2)



(3)

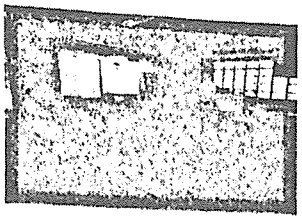


(4) ✓



(4)

10 Which of the following is likely the height of a P6 classroom in Nanyang Primary School?



(1) 35 m

(2) 350 m

(3) 35 cm = 0.35m

✓ (4) 350 cm = 3.5m (4)

11 Arrange the following fractions from the smallest to the largest.

$2\frac{2}{7}$, $\frac{4}{3}$, $\frac{9}{4}$, $2\frac{2}{5}$

$2\frac{2}{7}$, $1\frac{1}{3}$, $2\frac{1}{4}$, $2\frac{2}{5}$

1) Change $\frac{4}{3}$ and $\frac{9}{4}$ to mixed nos.
2) Make the numerators the same.
3) Compare the denominators. Larger denominator → smaller value

Smallest Largest

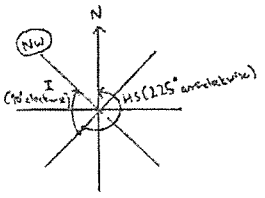
(1) $2\frac{2}{7}$, $2\frac{2}{5}$, $\frac{9}{4}$, $\frac{8}{3}$

(2) $\frac{9}{4}$, $2\frac{2}{7}$, $\frac{8}{3}$, $2\frac{2}{5}$

(3) $\frac{9}{4}$, $2\frac{2}{7}$, $2\frac{2}{5}$, $\frac{8}{3}$ ✓

(4) $2\frac{2}{7}$, $\frac{9}{4}$, $2\frac{2}{5}$, $\frac{8}{3}$ (3)

12 At first, Hang Seng and Ishmael were facing the same direction. Hang Seng turned 225° anti-clockwise to face North and Ishmael turned 90° clockwise. Which direction did Ishmael face in the end?



(1) North-East

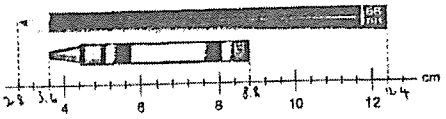
(2) North-West ✓

(3) South-East

(4) South-West

(2)

13 Find the total length of the crayon and the pencil.



5 gaps → 2cm

1 gap → 2cm ÷ 5 = 0.4cm

Crayon → 8.8cm − 3.6cm = 5.2cm

Pencil → 12.4cm − 2.8cm = 9.6cm

5.2cm + 9.6cm = 14.8cm

(1) 13.4 cm

(2) 14.4 cm

(3) 14.8 cm ✓

(4) 21.2 cm

(3)

14 In a camp, the number of boys is $\frac{4}{5}$ of the number of girls. The number of children is $\frac{2}{5}$ of the number of adults. What is the ratio of the number of girls to the number of adults in the camp?

B : G : Children Children : Adults

4 : 5 : (9) Make children the same no. of units in both ratios (2) : 5

8 : 10 : 18 18 : 45

G : Adults

10 : 45

2 : 9

(1) 1 : 8

(2) 9 : 1

(3) 2 : 9 ✓

(4) 9 : 2

(3)

15 The first 20 numbers in a pattern are shown below. What is the digit in the ones place of the 294th number?

11, 13, 16, 18, 19, 20 (1st)	21, 23, 26, 28, 29, 30	31, 33, 36, 38, 39, 40	41, 43 ... (20th)
Pattern (digit in ones place) 1 3 6 8 9 0	1 3 6 8 9 0	1 3 6 8 9 0	

(1) 1

(2) 0 ✓

(3) 8

(4) 9

(2)

Pattern repeats every 6 numbers.

294 ÷ 6 = 49

Thus, since every number in a position that is a multiple of 6 has a '0' in the ones place (6th → 20, 12th → 30, 18th → 40), the 294th number must also have a '0' in the ones place since 294 is a multiple of 6.

Questions 16 to 20 carry 1 mark each. Write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (5 marks)

16 Jing Xuan had 63 pencils. She sold $\frac{2}{3}$ of her pencils. How many pencils did she sell?

$63 \times \frac{2}{3} = 42$

Ans: 42

17 Express 9 kg 28 g in kilograms.

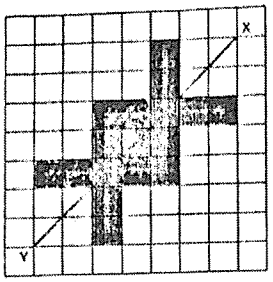
1 g = $\frac{1}{1000}$ kg

28 ÷ 1000 = 0.028

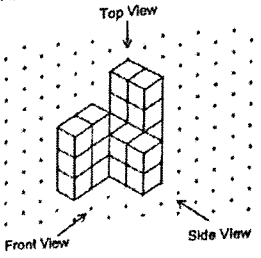
9 + 0.028 = 9.028

Ans: 9.028 kg

18 The figure below shows 11 squares. Shade the least number of squares such that line XY is the line of symmetry of the figure.

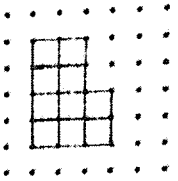


19 The solid below is made up of 20 unit cubes.

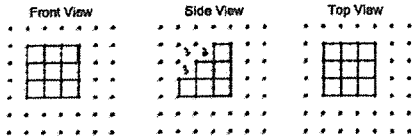


Draw the front view of the solid on the grid below.

Front View



20 Below shows the front view, side view and top view of a solid built using unit cubes. What is the smallest number of unit cubes that must be added to the solid to make it a cube?



3 x 3 = 9

Ans: 9

Questions 21 to 30 carry 2 marks each. Show your working clearly and write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (20 marks)

21 Write down all the common multiples of 6 and 8 that are less than 70.

Multiples of 6 : 6, 12, 18, (24), 30, 36, 42, (48), 54, 60, 66
Multiples of 8 : 8, 16, (24), 32, 40, (48), 56, 64

Ans: 24, 48

22 A notebook costs $2.65 and a pencil costs $0.90.

(a) Find the total cost of one such notebook and one such pencil.

$2.65 + $0.90 = $3.55

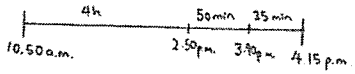
Ans: (a) $ 3.55

(b) Mrs Chia bought 200 such notebooks and 200 such pencils. How much did she pay altogether?

$3.55 x 200 = $710

Ans: (b) $ 710

23 Bob participated in a competition that lasted 4 h 50 min. After the competition, he waited 35 min for his mother to fetch him. His mother fetched him at 4.15 p.m. What time did Bob's competition start?



Ans: 10.50 a.m.

24 Faizal had 50 eggs. He sold all his eggs. What was the percentage decrease in the number of eggs he had?

$\frac{50}{50} \times 100\% = 100\%$

Ans: 100 %

25 Sarah uses the same amount of flour to bake each cake. She uses 876 g of flour to bake 6 cakes. How much flour is needed to make 8 such cakes?

1 cake → 876 g ÷ 6 = 146 g

8 cakes → 146 g × 8 = 1168 g

Ans: 1168 g

26 Gerald had $\frac{4}{5}$ ℓ of milk at first. He drank $\frac{1}{4}$ ℓ of milk in the morning and $\frac{1}{8}$ ℓ of milk in the afternoon. How much milk did Gerald have left?

$\frac{4}{5}\ell - \frac{1}{4}\ell - \frac{1}{8}\ell = \frac{32}{40}\ell - \frac{10}{40}\ell - \frac{5}{40}\ell$

$= \frac{17}{40}\ell$

Ans: $\frac{17}{40}$ ℓ

27 Hani had a roll of ribbon which was 4 m in length. She cut the ribbon into smaller pieces, each measuring $\frac{9}{10}$ m. She gave her sister the greatest number of such smaller pieces she could cut from the roll. How much ribbon did Hani have left?

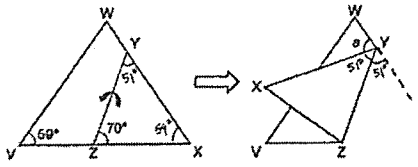
$4\text{m} \div \frac{9}{10}\text{m} = 4\frac{4}{9}$

She had $\frac{4}{9}$ of a $\frac{9}{10}$ m-piece left.

$\frac{\overset{2}{\cancel{4}}}{\underset{1}{\cancel{9}}} \times \frac{\overset{1}{\cancel{9}}}{\underset{5}{\cancel{10}}}\text{m} = \frac{2}{5}\text{m}$

Ans: $\frac{2}{5}$ m

28 Kelly has a triangular piece of paper VWX with VW = WX. VZX and WYX are straight lines. ∠WVX = 59° and ∠XZY = 70°. She folded it along the line YZ as shown below. Find ∠a.



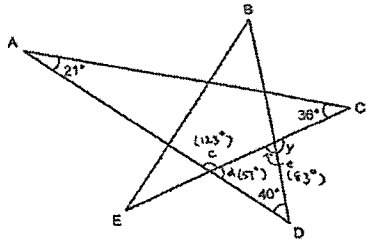
∠YXV = ∠WVX = 59°

∠XYZ = 180° − 70° − 59°
= 51°

∠a = 180° − 51° − 51°
= 78°

Ans: 78 °

29 The figure below is formed by five straight lines, AC, AD, BD, BE and CE. ∠CAD = 21°, ∠ACE = 36° and ∠ADB = 40°. Find ∠y.



∠c = 180° − 21° − 36°
= 123°

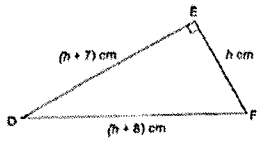
∠d = 180° − 123°
= 57°

∠e = 180° − 57° − 40°
= 83°

∠y = 180° − 83°
= 97°

Ans: 97 °

30 Triangle DEF is a right-angled triangle. The lengths of its sides are h cm, $(h + 7)$ cm and $(h + 8)$ cm. What is the area of triangle DEF if $h = 5$?



$EF = 5\text{cm}$

$ED = (5+7)\text{cm}$

$= 12\text{cm}$

$\frac{1}{2} \times 12\text{cm} \times 5\text{cm} = 30\text{cm}^2$

Ans: 30 cm²

End of Paper

Questions 1 to 5 carry 2 marks each. Show your working clearly and write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (10 marks)

1 Abby has m cookies. Benson has 5 times as many cookies as Abby. Charlie has 4 more cookies than Benson. Abby, Benson and Charlie have 59 cookies altogether. How many cookies does Abby have?

$B \rightarrow 5m$

$C \rightarrow 5m + 4$

$m + 5m + (5m + 4) = 59$

$11m + 4 = 59$

$11m = 59 - 4$

$= 55$

$m = 55 \div 11$

$= 5$

Ans: 5

2 A printing machine prints 240 pages in $\frac{1}{6}$ h. How many pages does it print in 3.5 h?

$\frac{1}{6}\text{h} \rightarrow 240$

$1\text{h} \rightarrow 240 \times 6$

$= 1440$

$3.5\text{h} \rightarrow 1440 \times 3.5$

$= 5040$

Ans: 5040

3 The average of a set of 7 numbers is 7. A number is added to the set and the average becomes 10. What is the number?

Sum of 7 numbers $= 7 \times 7$

$= 49$

Sum of 8 numbers $= 8 \times 10$

$= 80$

$80 - 49 = 31$

Ans: 31

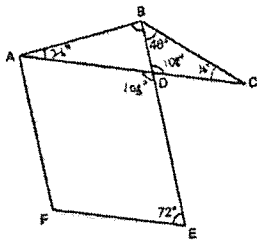
4 What is the price of the car after adding 9% GST?

$188 000
(Price Before GST)

$\$188000 \times \frac{109}{100} = \$204920$

Ans: $ 204920

5 In the figure below, ABC is an isosceles triangle and AB = BC. ADEF is a parallelogram. $\angle CBD = 48°$ and $\angle DEF = 72°$. BDE is a straight line. Find $\angle ABD$.



$\angle ADC = 180° - 72°$

$= 108°$

$\angle BDC = \angle ADC$

$= 108°$ (vertically opposite angles)

$\angle BCA = 180° - 46° - 108°$

$= 26°$

$= \angle BAC$

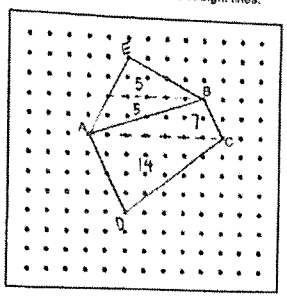
$\angle ABD = 180° - 46° - 26° - 26°$

$= 82°$

Ans: 82

For questions 6 to 17, show your working clearly and write your answers in the spaces provided. The number of marks available is shown in brackets [ ] at the end of each question or part-question. (45 marks)

6 In the square grid below, AB and BC are straight lines.



(a) By joining the dots on the grid with straight lines, draw a trapezium ABCD such that AD is parallel to BC and AD is twice as long as BC. [1]

(b) By joining the dots on the grid with straight lines, draw a triangle ABE such that AE is perpendicular to BE and AE = BE. Triangle ABE does not overlap with trapezium ABCD. [1]

(c) Find the ratio of the area of trapezium ABCD to the area of triangle ABE. Express the answer in its simplest form.

ABE → 5+5 = 10 ABCD → 7+14 = 21

Ans: 21:10 [1]

ABCD : ABE
21 : 10

7 A baker had some tarts and cookies. He packed the tarts in boxes of 6 and the cookies in boxes of 10. He sold each box of tarts for $28.80 and each box of cookies for $22.20. He sold 4 times as many boxes of tarts as boxes of cookies. He earned a total of $2198.40 from the sale of all the boxes of tarts and boxes of cookies. How many tarts did he sell?

4 boxes of tarts → $28.80 × 4
= $115.20

1 set (4 boxes of tarts + 1 box of cookies) → $115.20 + $22.20
= $137.40

Number of sets sold = $2198.40 ÷ $137.40
= 16

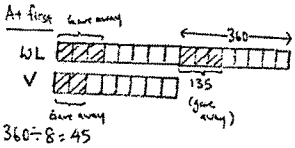
Boxes of tarts sold = 16 × 4
= 64

Tarts sold = 64 × 6
= 384

Ans: 384 [3]

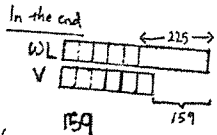
8 At first, Wei Liang had 360 more stickers than Vikram. Wei Liang gave $\frac{3}{8}$ of his stickers to Sue and Vikram gave $\frac{1}{4}$ of his stickers to Sue. In the end, Wei Liang had 159 more stickers than Vikram. How many stickers did Vikram have at first?

At first



360 ÷ 8 = 45
45 × 3 = 135
360 − 135 = 225

In the end



6 units + 159 = 5 units + 225
1 unit = 225 − 159
= 66

8 units = 66 × 8
= 528

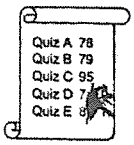
Ans: 528 [3]

9 The table below shows the type of medals to be awarded for a Mathematics competition.

Type of Medals	Gold	Silver	Bronze
Average of the best 4 quizzes' score	85 to 100	70 to 84	50 to 69

Every participant has to take part in a total of 5 quizzes. A medal will be awarded using the average of the best 4 quizzes' score.

Part of Tim's score sheet is smudged and the scores for the first 3 quizzes are shown below.



Given all his scores are whole numbers, what is the lowest possible score Tim must get in Quiz E to get a Gold medal?

Assume Tim scored 79 for Quiz D

Total score for Gold medal → 85 × 4
= 340

340 − 79 − 95 − 79 = 87

Ans: 87 [3]

10 At 09 00, Peter travelled from City A to City B at a constant speed of 80 km/h. Half an hour later, Timothy travelled from City A to City B at a constant speed along the same route. After Timothy travelled 240 km, he caught up with Peter. Timothy took 5 hours to travel from City A to City B. Find the distance between City A and City B.

Time taken for Peter to travel 240km = 240km ÷ 80km/h
= 3h

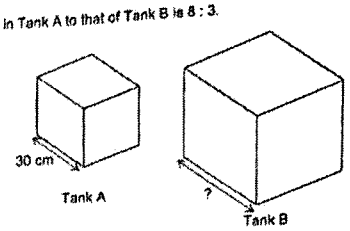
Time taken for Timothy to catch up with Peter = $3h - \frac{1}{2}h$
= $2\frac{1}{2}h$

timothy
Peter's speed = $240km \div 2\frac{1}{2}h$
= 96km/h

96km/h × 5h = 480km

Ans: 480km [3]

11 Tank A and Tank B are cubical tanks. Tank A has a length of 30 cm. Tank A is completely filled with water and Tank B is empty. After $\frac{2}{5}$ of the water from Tank A is poured into Tank B, the ratio of the height of water in Tank A to that of Tank B is 8 : 3.



(a) Find the amount of water poured from Tank A to Tank B.

$\frac{2}{5} \times 30 \times 30 \times 30 = 10800$

Ans: (a) $10800 cm^3$ [1]

(b) Find the length of Tank B.

Height of A in the end = $(1 - \frac{2}{5}) \times 30$ cm
= 18 cm

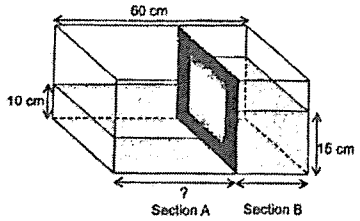
Height of B in the end = 18cm ÷ 8 × 3
= 6.75 cm

Base area of B = $10800 cm^3 \div 6.75 cm$
= $1600 cm^2$

$\sqrt{1600}$ cm = 40 cm

Ans: (b) 40 cm [3]

12 The length of a rectangular tank is 60 cm as shown below. A divider is put into the rectangular tank to create 2 sections, Section A and Section B. An equal amount of water is poured into Section A and Section B. The height of the water in Section A is 10 cm and the height of the water in Section B is 15 cm.



(a) What is the length of Section A?

Section A and B both have the same breadth (b)
Let Section A's length be L and Section B's length be M

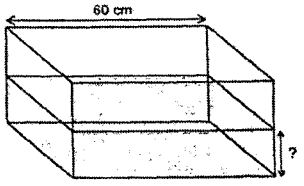
$b \times L \times 10 = b \times M \times 15$
$10L = 15M$
$L = \frac{15}{10}M$
$= 1.5M$

$L = 1.5 \times 24$ cm
$= 36$ cm

$1.5M + M = 60$ cm
$2.5M = 60$ cm
$M = 60cm \div 2.5$
$= 24$ cm

Ans: (a) 36 cm [2]

(b) The divider is removed from the rectangular tank. What is the height of the water in the tank now?



Let the breadth of the tank = b cm

Volume of water → $(b \times 24 \times 15)cm^3 + (b \times 36 \times 10)cm^3 = (360b + 360b)cm^3$
$= 720b\ cm^3$

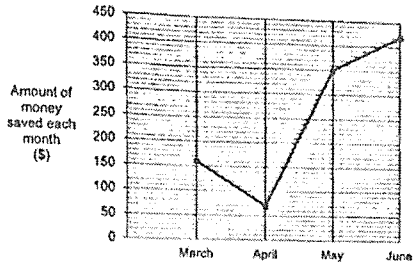
Height → $\frac{\text{Volume of water}}{\text{Length of tank} \times b\text{ cm}}$

$= \frac{720b\ cm^3}{60b\ cm^2}$

$= 12$ cm

Ans: (b) 12 cm [2]

13 The line graph shows the amount of money that Raj saved each month from March to June.



(a) How much more did he save in May than April?

$350 - $70 = $280

Ans: (a) $280 [1]

(b) What was the percentage increase in his savings from May to June?

Increase = $420 - $350
= $70

% increase = $\frac{70}{350} \times 100\% = 20\%$

Ans: (b) 20% [1]

(c) The amount of money Raj saved in July was $\frac{1}{5}$ of the total amount of money he saved from March to July. How much did he save in July?

July → 1 unit
March to June → 5 units - 1 unit
= 4 units

4 units = $120 + $70 + $350 + $420
= $1000
1 unit = $1000 ÷ 4
= $250

Ans: (c) $250 [2]

14 David and Edmond had some stamps at first. The ratio of the number of stamps David had to that of Edmond was 1 : 4. David gave $\frac{1}{3}$ of his stamps to Edmond. After that, Edmond then gave $\frac{1}{2}$ of his stamps to David. David had 170 stamps in the end.

(a) How many stamps did David have at first?

At first
D : E
1 : 4
3 : 12

David gave $\frac{1}{3}$ of his stamps to Edmond.
$\frac{1}{3} \times 3 = 1$
D → 3 − 1 = 2
E → 12 + 1 = 13

D : E
2 : 13

Edmond gave $\frac{1}{2}$ of his stamps to David, so
$\frac{1}{2} \times 13$ units = 6.5 units → Edmond (in the end)
6.5 units + 2 units = 8.5 units → David (in the end)

8.5 units = 170
1 unit = 170 ÷ 8.5
= 20

3 units = 20 × 3
= 60

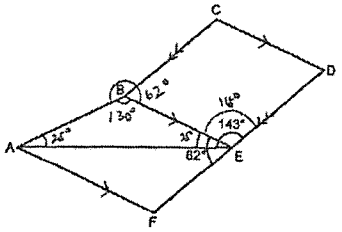
Ans: (a) 60 [2]

(b) How many stamps did Edmond have in the end?

6.5 units = 20 × 6.5
= 130

Ans: (b) 130 [2]

15 In the figure below, BCDE is a rhombus. DEF is a straight line. AF, BE and CD are parallel to each other. AB = BE, ∠BEF = 62° and ∠AED = 143°.



(a) Find ∠AEB.

∠BED = 180° − 62°
= 118°
∠AEB = 143° − 118°
= 25°

Ans: (a) 25° [2]

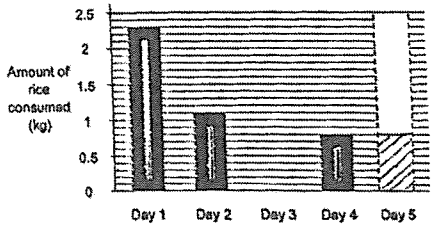
(b) Find ∠ABC.

∠BAE = ∠AEB = 25°
∠ABE = 180° − 25° − 25°
= 130°
∠CBE = 180° − 118°
= 62°

∠ABC = 360° − 130° − 62°
= 168°

Ans: (b) 168° [2]

16 The Tan family finished 5 kg of rice in 5 days.
The graph below shows the amount of rice consumed by the Tan family from Day 1 to Day 5. The bar that shows the amount of rice consumed on Day 5 is not drawn.



(a) No rice was consumed on Day 3. Draw the bar for the amount of rice consumed by the Tan family on Day 5. [1]

5 kg − 2.3 kg − 1.1 kg − 0.8 kg = 0.8 kg

(b) What fraction of the 5 kg of rice was consumed on Day 1?

$\frac{2.3}{5} = \frac{23}{50}$

Ans: (b) $\frac{23}{50}$ [1]

(c) 200 g of rice filled 1 cup. How many of such cups of rice were consumed in all by the end of Day 4?

200 g = 0.2 kg
2.3 kg + 1 kg + 0.8 kg = 4.2 kg
4.2 kg ÷ 0.2 kg = 21

Ans: (c) 21 [1]

(d) The average amount of rice consumed from Day 1 to Day 7 was 0.9 kg. Write down 1 possible set of values for the amount of rice consumed on Day 6 and Day 7.

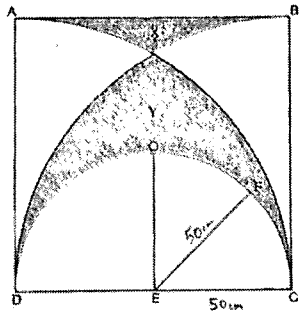
Total consumed in 7 days = 0.9 kg × 7
= 6.3 kg

Day 6 and 7 → 6.3 kg − 5 kg
= 1.3 kg

Both values must add up to 1.3 kg.

Ans: (d) 0.3 kg, 1 kg [2]

17 The figure below is made up of a square ABCD, a semicircle DOC and 2 overlapping quarter circles DCB and ACD. DE = EC, F is a point on arc DOC, OE is a straight line and the length of EF is 50 cm.
(Take $\pi = 3.14$)



(a) Find the area of the semicircle DOC.

$\frac{1}{2} \times 3.14 \times 50\text{cm} \times 50\text{cm} = 3925\text{cm}^2$

Ans: (a) 3925cm² [2]

(b) Find the difference between area X and area Y.

Area of quarter circle (ADC) $= \frac{1}{4} \times 3.14 \times 100\text{cm} \times 100\text{cm}$
$= 7850\text{cm}^2$

Area of ACD −
Area of semicircle (DOC) $= 7850\text{cm}^2 - 3925\text{cm}^2$
$= 3925\text{cm}^2$

Area of "boomerang" (ABC) $= (100 \times 100)\text{cm}^2 - 7850\text{cm}^2$
$= 2150\text{cm}^2$

$Y - X = 3925\text{cm}^2 - 2150\text{cm}^2$
$= 1775\text{cm}^2$

Ans: (b) 1775cm² [3]

End of Paper