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). Shade the oval (1, 2, 3 or 4) on the Optical Answer Sheet. (20 marks)

_____

_

1. Express $4\dfrac{1}{50}$ as a decimal.

    (1) 4.02
    (2) 4.002
   (3) 4.05
    (4) 4.005

2. Sam's mass is 45 kg. Peter's mass is 15 kg more than Sam. Express Peter's mass as a fraction of their total mass.

    (1) $\dfrac{1}{4}$

    (2) $\dfrac{3}{4}$

    (3) $\dfrac{3}{7}$

    (4) $\dfrac{4}{7}$

3. Which of the following is the same as 7070 ml?

    (1) 7 ℓ 7 ml
   (2) 7 ℓ 70 ml
    (3) 70 ℓ 7 ml
    (4) 70 ℓ 70 ml

4. The figure below shows a 5-cm cube. Find the area of the shaded face.
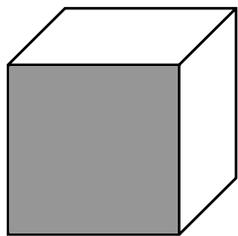
(1) 5 cm²
(2) 20 cm²
(3) 25 cm²
(4) 125 cm²

5. The average of 9 whole numbers is 9. If the average of 8 of these numbers is 8, what is the 9th number?

(1) 8
(2) 9
(3) 17
(4) 64

6. A survey was conducted to find out the types of pets owned by a group of children and the result is represented by the pie chart below.
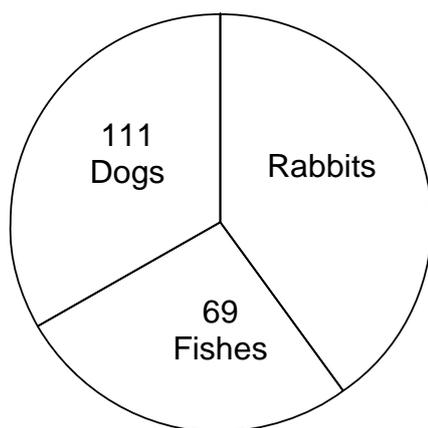

$\dfrac{2}{5}$ of the number of children owned rabbits. How many children took part in the survey?

(1) 60
(2) 180
(3) 300

(4) 450

7. ABCD is a rhombus. Find $\angle y$.
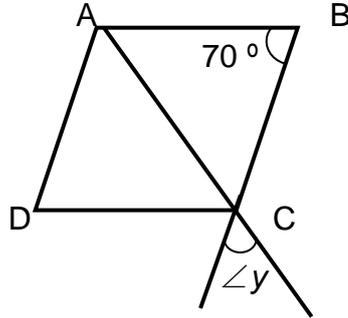
(1) 35^0
(2) 55^0
(3) 70^0
(4) 110^0

8. In the figure below, AB // CD. Find x.

(1) 33^0
(2) 42^0
(3) 105^0
(4) 132^0
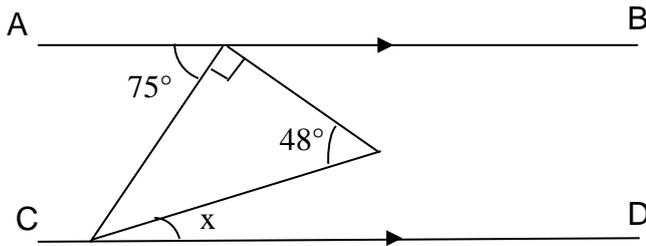
9. The number of members in a gym increased from 900 to 1260 over a year. What was the percentage increase in the number of members for this period?

(1) 20%
(2) 25%
(3) 40%
(4) 125%

10. Simplify 5r + 5 – 3r + 4.

      (1) 4r + 2
      (2) 4r + 8
      (3) 8r + 2
      (4) 2r + 9

11.   Which of the following has the largest value?

      (1) $\dfrac{3}{8} \div \dfrac{3}{5}$

      (2) $\dfrac{3}{5} \div \dfrac{8}{3}$

      (3) $\dfrac{2}{3} \times \dfrac{3}{8}$

      (4) $\dfrac{5}{8} \times \dfrac{3}{5}$

12. 5 speed cameras were positioned at a distance of 50 km apart from

each other along a highway. The table shows the time when a van travelling the highway was photographed by each camera.

Speed Camera	Time
1	08 45
2	09 10
3	09 50
4	10 20
5	10 55

Between which speed cameras did the van travel at an average speed of **more** than 100 km/h?

    (1)   1 and 2
    (2)   2 and 3
    (3)   3 and 4
    (4)   4 and 5

13.   Two quadrants of the same radius are cut out from a square as shown below. Find the perimeter of the figure that is left. (Take $\pi = 22/7$)

28 cm
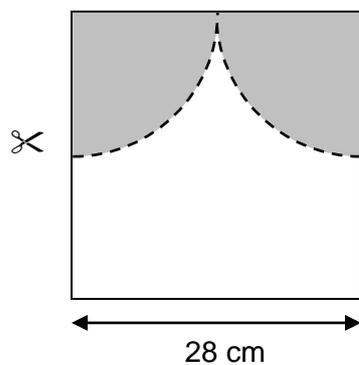
    (1)   72 cm
    (2)   100 cm
    (3)   232 cm
    (4)   364 cm

14. Aaron and Benny started driving from Woodlands Checkpoint at the same time, heading towards Kuala Lumpur travelling along the same route. After 1 hour, Aaron completed $\frac{1}{2}$ of the journey, while Benny completed $\frac{1}{3}$ of the journey. If Aaron's driving speed was 40 km/h faster than Benny, what was the distance between the Woodlands Checkpoint and Kuala Lumpur?

    (1)   40 km
    (2)   80 km
    (3)   120 km
    (4)   240 km

15.   The bar graph below shows the marks obtained by 90 pupils in a Science test.
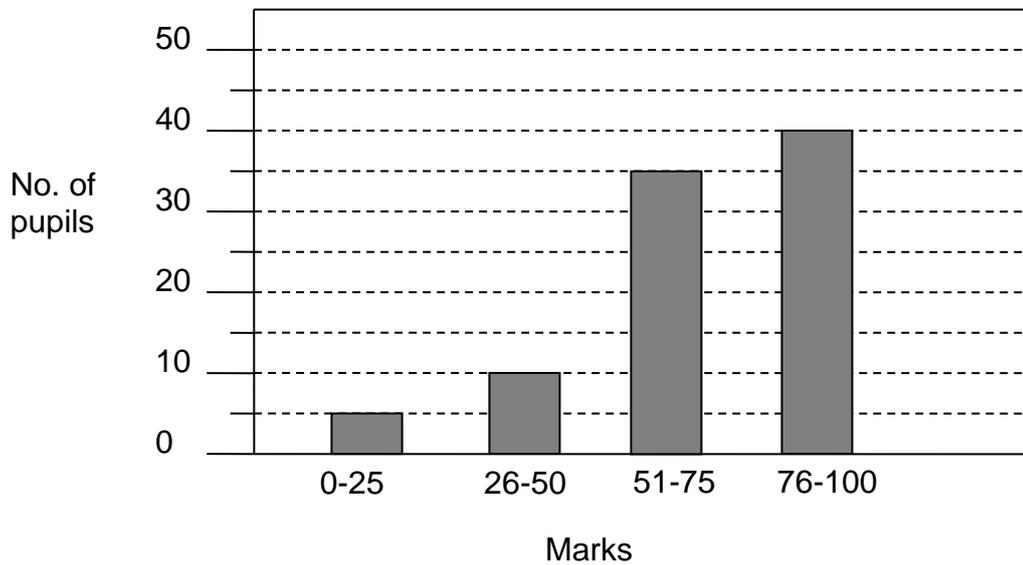
A score of 50 marks or more is considered a 'pass' and 6 pupils scored exactly 50 marks. What percentage of pupils passed the test?

    (1) 10%

    (2) 12%

    (3) 83%

    (4) 90%

**END OF BOOKLET A**

(Go on to the next page.)

Questions **16** to **25** carry 1 mark each. Write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (10 marks)

16. What is the sum of 103 hundredths and 4 thousandths, correct to 2 decimal places?

Ans: _____

17. Express $3\frac{2}{5}$ h in minutes.

Ans: _____ min

18. The volume of the cuboid shown is 120 cm³. What is the breadth of the cuboid?

5 cm

?

8 cm
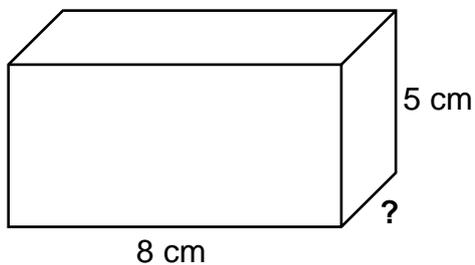
Ans: _____

(Go on to the next page.)

19. Alex and Bryan have an equal amount of money. Alex gives $\frac{2}{3}$ of his money to

Bryan. What is the ratio of Alex's money to Bryan's money now?

Ans: _____

20.   To make a jug of orange drink, Alan mixed 500 $m\ell$ of syrup with 1.5 ℓ of water. He then poured out 4 glasses of drink to serve his friends. As each glass has a capacity of 300 mℓ, how much orange drink is left in the jug? Give your answer in ℓ.

Ans: _____ ℓ

21. Mdm Jamilah packed $\dfrac{3}{14}$ kg of cherries equally into 4 bags. Find the mass of cherries in each bag.

Ans: _____ kg

22. How many faces are there in the solid below?
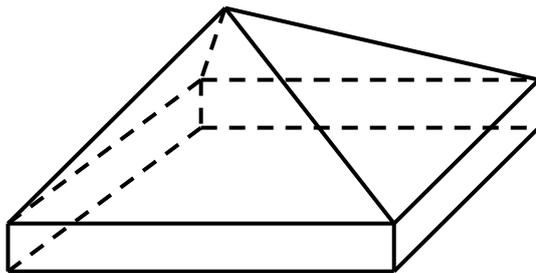
Ans: _____face(s)

23. In the figure below, AB // DC. Find $\angle m$

A, B, 121°, 25°, m, D, C

Ans: _____ °
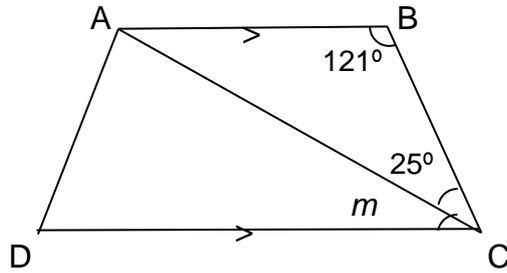
24. The cube in Figure 1 was cut into three identical blocks.
The three blocks were used to form the cuboid in Figure 2.

Figure 1

Figure 2

U, T, R, S
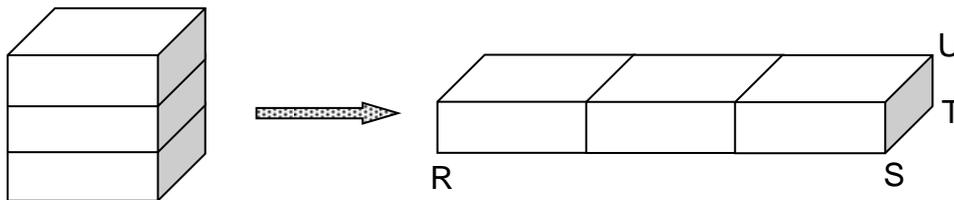
Find the ratio of RS to ST to TU.

Ans: _____

25. 3 kg of rambutans cost $4x$ and 3 kg of grapes cost $7 more than 1 kg of rambutans.
Find the cost of 3 kg of grapes in terms of x.

Ans: $_____

Questions **26** to **30** carry 2 marks each. Show your working clearly in the spaces below each question and write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (10 marks)

_____

26. Jenny gave $\frac{1}{4}$ of her chocolates to her brother and ate $\frac{1}{3}$ of the remainder. If she had 16 chocolates left, how many chocolates did she give to her brother?

Ans: _____

27. In the figure below, there are 2 identical shaded semi-circles. O is the centre of the big circle with a diameter of 14 cm. What is the perimeter of the unshaded area? (Take $\pi = \frac{22}{7}$)

O

14 cm

Ans: _____
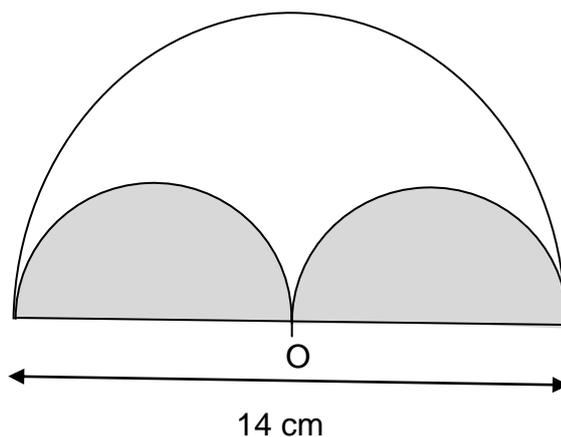
28. A drink stall sold 3 kinds of bottled juices. Each bottle of lemon juice cost $2.50, each bottle of orange juice cost $3 and each bottle of grape juice cost $2. If the number of bottled juices sold over three days was in the ratio of 4 : 6 : 9 respectively, find the average cost of each bottle sold during these three days. Leave your answer in the nearest 2 decimal places.

Ans: _____

29. What is the most number of rectangles of sides 4 cm by 3 cm that can be cut from a cardboard of sides 51 cm by 28 cm?

Ans: _____

30. Extend the tessellation by drawing another **2 more** unit shapes in the space provided.
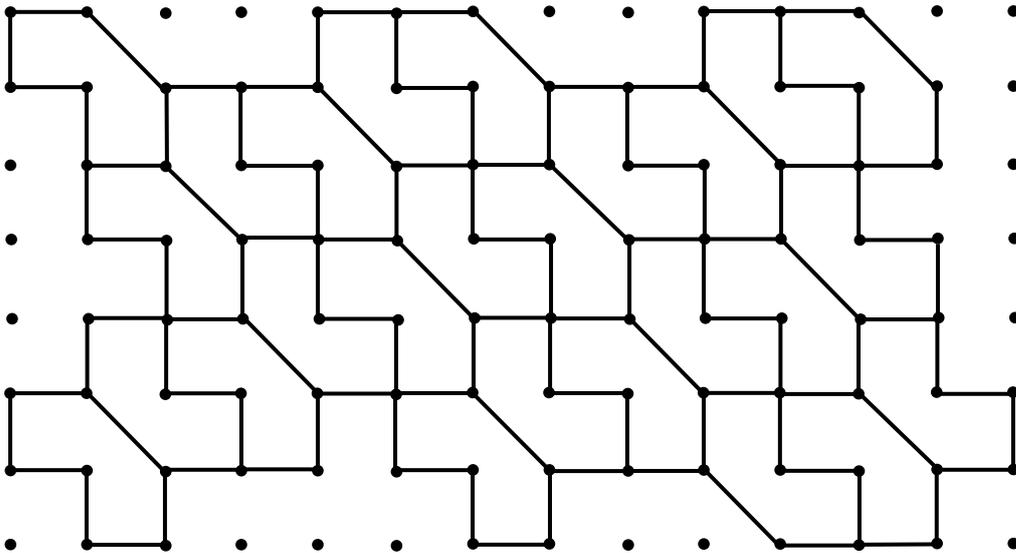
END OF PAPER 1

Questions **1** to **5** carry 2 marks each. Show your working 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. (10 marks)

1. The school conducted a survey with some pupils on how they travelled to school.
There were twice as many boys as girls who travelled to school by MRT.
$\frac{1}{5}$ of those who travelled by bus were girls. The table below shows the findings.

	Walk	MRT	Car	Bus	Total
Boys	5	?	24	?	107
Girls	10	?	12	8	53

Study the table. How many boys took MRT to school?

Ans: _____

2. There are 25 % more women than men in a room. If 90 adults are in the room, how many men are there?

Ans: $_____

3. How many stars are needed to balance the 4 squares?
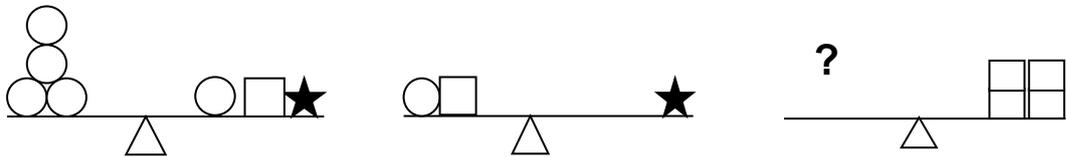
Ans: _____

4. BCD and ACE are equilateral triangles. CD is $\frac{1}{4}$ the length of CE. The two shaded triangles are identical. What fraction of ACE is shaded?

Ans:_____
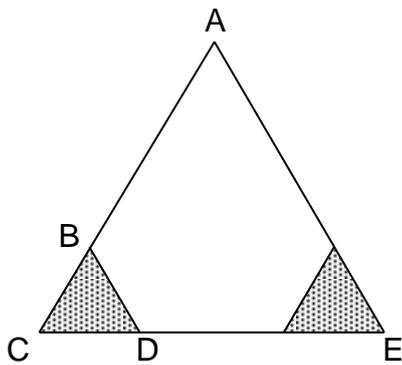
5. City X and City Y was 300 km apart. Sam and Dickson started driving from City X to City Y at the same time. In the journey, Sam passed by a petrol kiosk 1 hour before Dickson did. When Sam passed the petrol kiosk, Dickson was still 50 km behind him. How long did Dickson take to travel from City X to City Y?

Ans: _____h

For questions **6** to **18**, show your working 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. (50 marks)

6. Miss Chan distributed some sweets equally among 15 boys and 7 girls. Each boy gave $\frac{3}{5}$ of his share to all the girls. As a result, the girls had a total of 768 sweets. What was the total number of sweets Miss Chan had at first?

Ans: _____ **[3]**

7. Mr Oh had a farm. He kept a total of 89 goats and chickens. The total number of legs the animals had was 264 legs. How many chickens did Mr Oh have?

Ans: _____ **[3]**

8. The figure below is made up of three squares of sides 8 cm, 12 cm and 20 cm. Find the shaded area.

12 cm   20 cm   8 cm
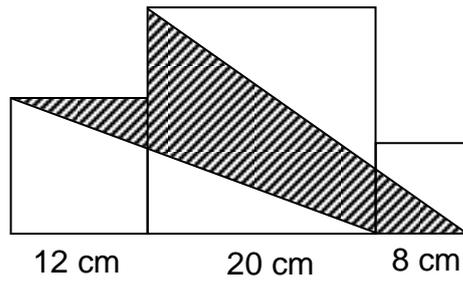
Ans: _____ **[3]**

9.   Sabrina placed 19 marbles in Bag W, 24 marbles in Bag X, 15 marbles in Bag Y and 80 marbles in Bag Z. Levi added an equal number of marbles into each of the bags. As a result Bag Z contained the same number of marbles as the total number of marbles in bags W, X and Y. How many marbles were there in Bag Z at the end?

Ans: _____ **[3]**

(Go on to the next page)

10. EF and FG are two sides of a parallelogram EFGH.

   (a) Complete the parallelogram by drawing the other two sides in the square grid below.

   (b) Draw a line from point F to point H. Find ∠ FHG in the parallelogram.

[2]
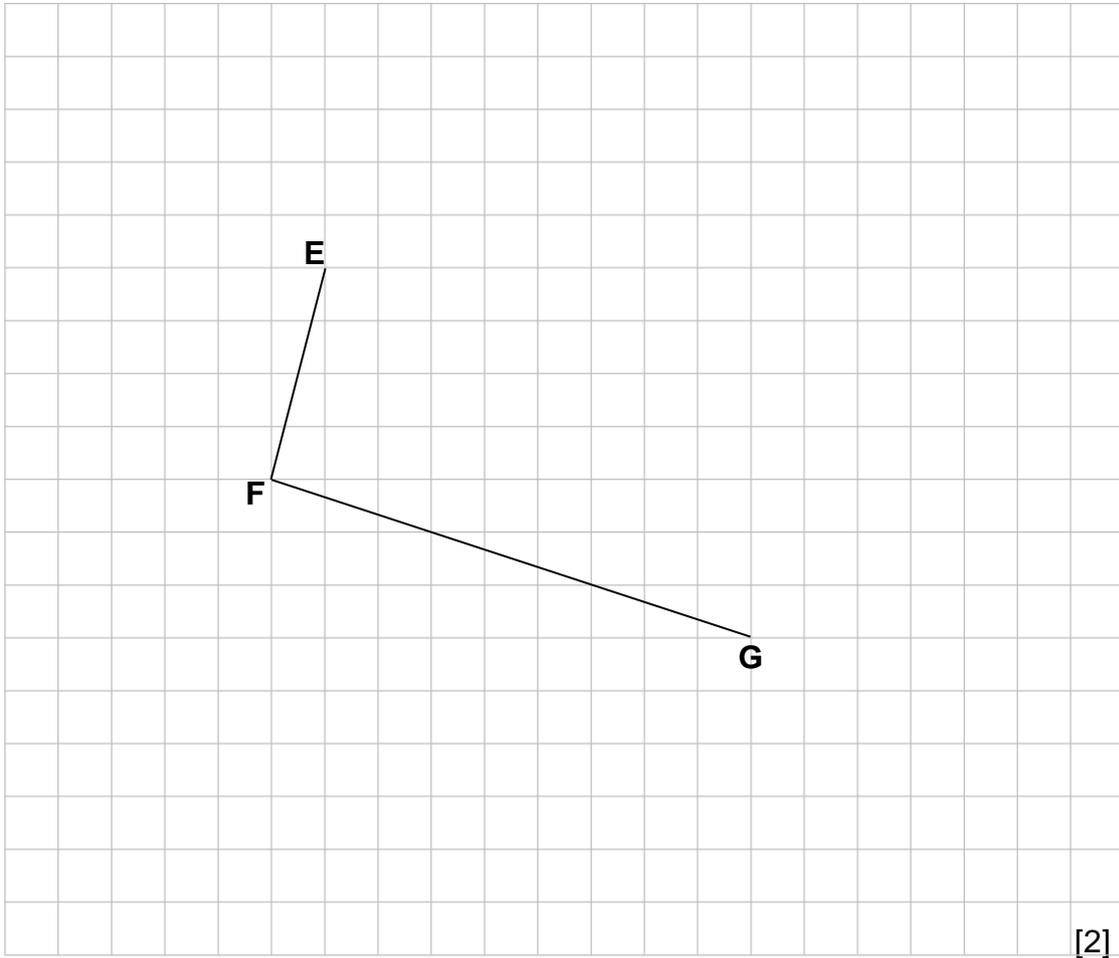
Ans: (b) _____ **[1]**

11. Ken and Amy have some books. If Ken sells 10 books per day and Amy sells 5 books per day, Ken will have 40 books left when Amy has sold all her books. If Ken sells 5 books per day and Amy sells 10 books per day, Ken will have 70 books left when Amy has sold all her books.

(a) How many books does Ken have?
(b) If each book is sold for $20, how much money can be collected from the sale of all their books?

Ans: (a)_____[2]

(b)_____[2]

12. Roys left Town X at 1 p.m. travelling at 64 km/h towards Town Y. Half an hour later, Jovin left Town X, travelling at 80 km/h towards Town Y.

(a) How far ahead was Roys when Jovin just left Town X?

(b) At what time would Jovin be 8 km ahead of Roys?

Ans:(a)_____**[1]**

(b)_____**[3]**

13.   The shaded square of Tank X has an area of 16 cm^2. The ratio of its breadth to its length is 1:16. Tank Y is a cube. The volume of Tank X is 25% that of Tank Y.

(a) Find the volume of Tank Y.

(b) Find the shaded area of Tank Y.

Tank X

Length

Tank Y

Ans: (a)_____ **[3]**

(b) _____**[1]**
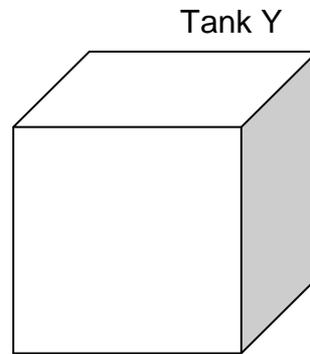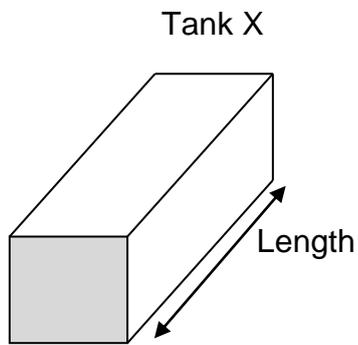
14. There are more pupils in School A than School B. 30% of the pupils in School A is 45 more than 40% of the pupils in School B. When 10% of the pupils in School A leaves to join School B, there are 200 more pupils in School A than School B. What is the percentage increase in the number of pupils in School B? (Leave you answer up to 2 decimal places.)

Ans: _____ **[4]**

15.   There were 70 more girls than boys in a theme park one day. On the next day, the number of boys increased by 30% but the number of girls decreased by 20%. There were 686 children on the second day. How much money was collected over the two days if children paid $3 each to enter the theme park?

Ans: _____ **[4]**

16. In the diagram, HBDG is a trapezium and triangles BEF and BDE are isosceles triangles. AC, AG and GC are straight lines. BD = BE = EF.
(a) Find ∠p.
(b) Find ∠q.
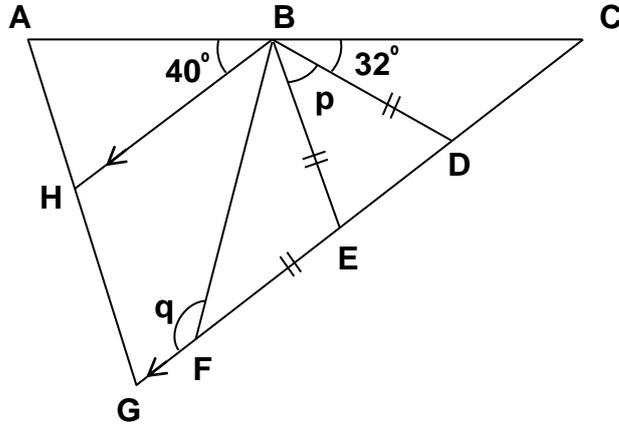
Ans: (a) _____ **[3]**

(b) _____ **[2]**

(Go on to the next page)

17.   In the diagram below, ABCD is a square and TS = TU = TV. AD is parallel to SU. AD is perpendicular to VT.

Find the sum of ∠ UVD and ∠SVA.
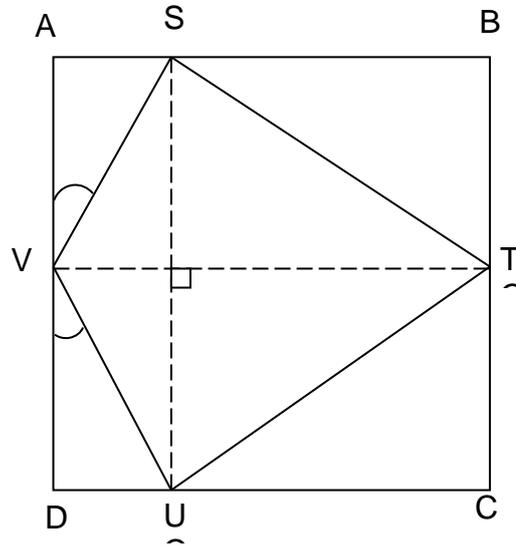
Ans:_____[5]

18. Kate had three boxes, A, B and C, containing a total of 1512 necklaces.

The number of necklaces in Box A to the total number of necklaces was 2 : 7.

Kate sold 190 necklaces from Box B and sold $\dfrac{1}{4}$ of the necklaces in Box C.

The number of necklaces left in Box B to the number of necklaces left in Box C was   2 : 1.
How many necklaces were there in Box C at first?

Ans: _____ **[5]**

END OF PAPER 2

Answer key paper 1

1.	1	4.	3	7.	2	10.	4	13.	2
2.	4	5.	3	8.	1	11.	1	14.	4
3.	2	6.	3	9.	3	12.	3	15.	4

Paper 1 booklet B

16. 1.03
17. 204
18. 3 cm
19. 1:5
20. 0.8ℓ
21. $\frac{3}{14}$ kg ÷ 4 = $\frac{3}{56}$ kg
22. 9
23. 34^0
24. 9 : 3 : 1
25.

> $\$(\dfrac{4x}{3} + 7)$

26.

$\frac{2}{3}$R →16

$\frac{3}{3}$R →24

$\frac{3}{4}$ of chocolates → 24 **[M1]**

$\frac{1}{4}$ of chocolates →8 **[A1]**

27.
Circumference of Big semicircle = 22 cm
Circumference of 2 shaded semicircle = Circumference of 1 small circle = 22 cm
Perimeter of unshaded part = 22 + 22 **[M1]**
= 44 cm **[A1]**

28. (2.50 x 4) + (3 x 6) + (2 x 9) = 46

$\frac{46}{4+6+9}$ = 2.421

= 2.42 **[M1, A1]**

29. 28 ÷ 4 = 7
51 ÷ 3 = 17
17 x 7 = 119 rectangles **[M1, A1]**

30.

Award A1 for each correct answer but maximum of
A2 for any 2 of the 3 possible answers.

Answer key paper 2

1.

	Walk	MRT	Car	Bus	Total
Boys	5	**46**	24	**32**	107
Girls	10	**23**	12	8	53

Girls: $\frac{1}{5}$ -------- 8

Boys: $\frac{4}{5}$ --------- **8 x 4** = 32

No. of boys who go to school by MRT = 107 – 24 – 32 – 5 = **46**   **[M1,A1]**

Or

53 – 10 – 12 – 8 = 23

23 x 2 = **46**   **[M1,A1]**

2.   men-----------100%
      Women------- 125%

225% --------90 adults
      100%--------90/ 225 x 100 = 40 men [M1,A1]

3.   ★ ★ **[A2]** or   ★ 2   **[A2]**

4. Total small triangles → 1 + 3 + 5 + 7 = 16
Fraction shaded → $\frac{2}{16}$ = $\frac{1}{8}$ [M1, A1]

5.   Dickson's speed = 50 km/h   [M1]
Time taken to travel = 300 km ÷ 50 km/h
                    = **6 h**   [A1]

6. 15 x $\frac{3}{5}$ = 9
Number of sweets given away by each boy = Total number of sweets 9 boys had

Sum of sweets 9 boys and 7 girls had = 768
16 children -------------------------------- 768 sweets
1 child -------------------------------------- 768 ÷ 16 = 48 **[M1]**
Number of sweets Miss Chan had at first → 48 x 22
                    = 1056   **[M1,A1]**

7. Assume all goats:
89 x 4 = 356
356 – 264 = 92   [M1]
92 ÷ 2 = 46   [M1, A1]
If use guess and check, [M2, A1]

8. 40 x 20 = 800

$\frac{1}{2}$ **x 32 x 12** = 192

$\frac{1}{2}$ **x 28 x 20** = 280   **[M1]**

12 x 8 = 96
800 – 192 – 280 – 96 = **232 cm^2**   **[M1,A1]**

9.

80					
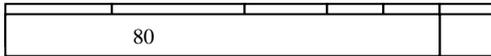
80 - 19 - 24 – 15 = 22   **[M1]**
2 units → 22
1 unit → 11   **[M1]**
80 + 11 = 91   **[A1]**

10(a)
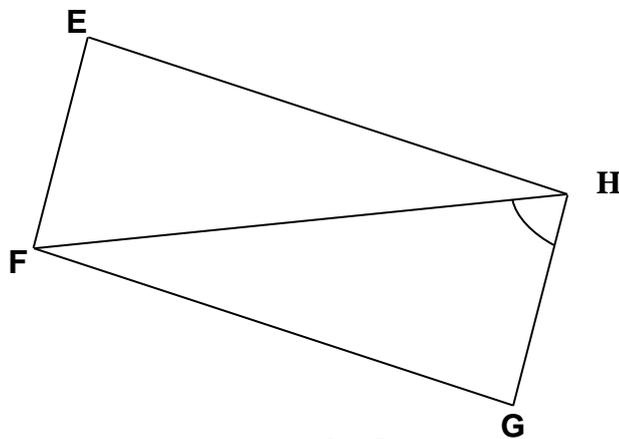
Drawing Accuracy   ± 0.1cm   **[M2]**
Missing label 'H'   **[- M0.5]**

10(b) **70⁰** ± 1⁰   **[A1]**

11.

Method 1:

1st scenario → Let u be the no. of days when all the books are sold

2nd scenario → Let p be the no. of days when all the books are sold

K : A	K : A
10u + 40 : 5u	5p + 70 : 10p

[M1]

From the ratio above,

10u +40 = 5p + 70
10u – 5p = 30 --------------------(1)

5u = 10p
 u = 2p -------------------------(2)

Subt u = 2p into (1)

10(2p) -5p = 30

20p -5p = 30

15p   = 30

 p   = 2 days

If p = 2 days, then Ken must sell

 5p + 70

= 5x2 + 70

= 80 books   ------------------------   **[A1]**

Sale of books - $20 x 100 = $2000   **[M1,A1]**

Method 2:
Guess and Check
It is obvious that the ratio of the no. of days between scenario 1 to scenario 2 must be 2:1

Days	K : A = Total	Days	K : A = Total
2	20 + 40 : 10 = 70	1	5 +70 : 10 = 85
4	40 + 40 : 20 = 100	2	10+70 : 20 = 100

[M1]

Hence Ken must sell 80 books   **[A1]**

Sale of books - $20 x 100 = $2000   **[M1,A1]**

Method 3:

Ken

Amy

Ken

70
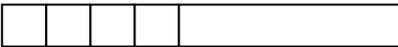
Amy

3 units → 30

1 unit → 10

Ken → 10 + 70 = 80 **[M1,A1]**

Total books → 80 + (10 x 2) = 100

Total sales → 100 x $20 **[M1]**

       = $2000 **[A1]**

12.

(a) $64 \div 2 = 32$ [A1]

(b)   80 – 64 = 16   [M1]
       32 + 8 = 40
       40 ÷ 16 = 2.5   [M1]
    2.5 h from 1.30 pm → 4 pm   [A1]

13.
(a) Breath of Tank A → 4 cm
Length of Tank A → 4 x 16 = 64 cm

Volume of Tank A → 4 x 4 x 64 = 1024 cm^3 **[M1]**

Volume of Tank B →1024 x 4 = 4096 cm^3 (16 x 16 x 16) **[M1, A1]**

(b)Length of 1 side of Tank B→ 16 cm
Shaded area of Tank B → 16 x 16 = 256 cm^2 **[A1]**

14.

| 30 | 30 | 30 | 10 |

School | 4u | 4u | 4u | 45 | 4u | 4u | 4u | 45 | 4u | 4u | 4u | 45 | 4u | 15 |

School | 3u | 3u | 3u | 3u | 3u | 3u | 3u | 3u | 3u | 3u |

| 40 | 40 | 20 |

School | 4u | 4u | 4u | 45 | 4u | 4u | 4u | 45 | 4u | 4u | 4u | 45 |

School | 3u | 3u | 3u | 3u | 3u | 3u | 3u | 3u | 3u | 3u | 4u | 15 |

| 200 |
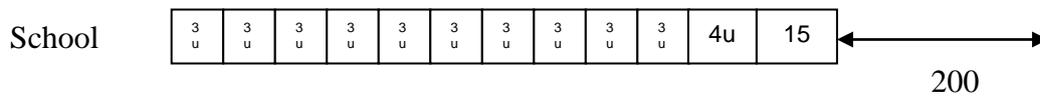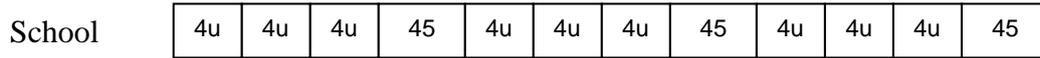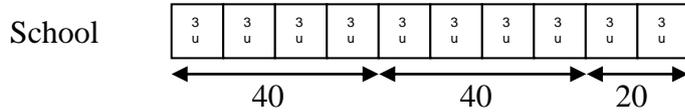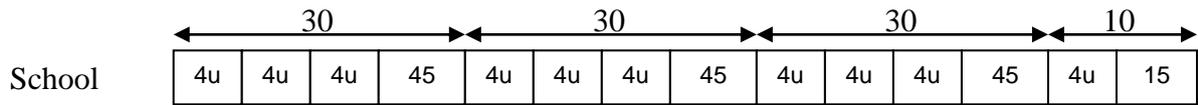
(a)

School A → 40 units + 150
School B → 30 units

36 units + 135 = 34 units + 15 + 200   [M1]
2 units = 80
1 unit = 40

4units+15=175   [M1]
30units= 1200
175/ 1200 x 100% = 14.58 (2 d.p) [M1, A1]

(b)
40 units + 150 = 1750
1750 − 1200 = 550
$\dfrac{550}{1750} \times 100\%$ = $31\dfrac{3}{7}$ %   [M1, A1]

15. **80% + ($\dfrac{4}{5}$ x 70)** = 80% + 56   **[M1]**

(130 + 80)% of 1st day = **686 − 56** = 630   **[M1]**

1st day = **($\dfrac{630}{21}$ x 20) + 70** = 670

(670 + 686) x 3 = **4068**   **[M1,A1]**

16.   (a)   **180⁰ − 40⁰ − 32⁰** = 108⁰   **[M1]**
180⁰ − 108⁰ = 72⁰
∠p = 180⁰ − 72⁰ − 72⁰ = **36⁰**   **[M1,A1]**

(b)   180⁰ − 72⁰ = 108⁰
(180⁰ − 108⁰) ÷ 2 = 36⁰

$\angle q = 180^0 - 36^0 = \mathbf{144^0}$ **[M1,A1]**

17.

Given that ABCD is a square,

AB = TU = TV = TS = CD

This means that triangle STU is an equilateral triangle

$\angle STU = 60°$ **[M1]**

$\angle VTU = 30°$ **[M1]**

Triangle VTU is an isosceles triangle, so

$\angle UVT = \angle SVT = 180° - 30° \div 2$

$= 75°$ **[M1]**

$\angle UVS = 75° + 75° = 150°$

Therefore sum of $\angle UVD$ and $\angle SVA = 180° - 150°$ **[M1]**

$= 30°$ **[A1]**

18.

A : Total	A : B & C
2 : 7	432 : 1 080

7 units → 1 512
1 unit → 1 512 ÷ 7 = 216   [M1]
2 units → 216 x 2 = 432
(B & C) 5 units → 216 x 5 = 1 080   [M1]

B [| | | | | ▓190▓] ⎫
C [| | | ▓]   ⎬ 1 080
    ⎭
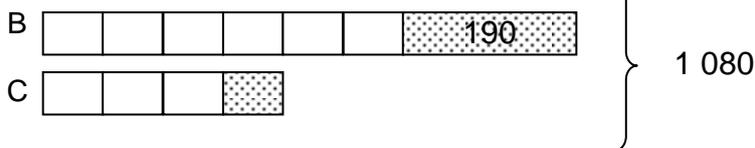
10 parts → 1 080 – 190 = 890   [M1]
1 part → 890 ÷ 10 = 89
4 parts → 89 x 4 = 356   [M1, A1]

MATH SURVIVAL TIPS: PASS MATH

PI (π)

Questions involving **π**

- In paper 2, if the value of **π** is not given, use the value of **π** in the calculator. (Note: This is not an assumption)
- Evaluate the value of **π** at the end of your working as evaluating the value of **π** early may end in the inaccuracy of your answer.
- If the question asks to leave your answer in **π**, do not evaluate the value of **π**, meaning you final answer must have the symbol **π**.

Assumption

- DNA – Do Not Assume unless you have enough evidence to state facts.

Simplest form

- Answers in fraction or ratio should be simplest form unless otherwise stated. (Note: Improper fraction is not simplest form).
- Answers in ratio should be in whole number, not in fraction or decimal.

Skip

- Omit (skip) the difficult questions first. Do the easy questions first (Paper 1: Q1-10, Q16-25). This can help you gain confidence as you progress doing the paper.

WARNING

Ensure also to use the appropriate signs (=, ≈, →) correctly.
Eg. $54 \div 5 \approx 10$, $50 \div 5 = 10$, $5\% = 0.05$, $5\% \to 240$.

Mini statements

- Make a habit of mini statements for each number sentence. This will help you to reflect back what you have done so far. Your checking will be more thorough.

Arithmetic Operations

- When doing any operation (+,-, x, ÷) do not continue from one operation to another as it will result in wrong mathematical statement.
  Eg. 45 + 67 = 112 + 4 = 116 as 45 + 67 ≠ 116

Techniques / Strategies

- Do not rely on one strategy. Applying the right strategy to solve the word problem can save lots of time. Better to be Jack of All Trades. Hence do not just read and solve the question. Think of a plan to solve first. This is the trademark of a good problem solver.

Have belief.

- Believe in yourself. Believe in your ability. Do not have the fear of failing. If you do that, half the battle is lost.

Start from Basic

- A good approach to mathematical problem is to know the concept well. Remember, knowing the formula is not enough. Formula is used to assist you in solving the problem. Always go back to basic.
  Eg: the topic on triangle. Do not just remember "half x base x height". What is more important that you must know that triangles of the same base and height or share the base and height will have the same area or triangle is half of a rectangle/square.

More and more tips ….

1. Take note that your result does not depend on how much you have studied for the exam but equally important is your performance on the day of the exam. **Not having enough rest or sleep will lead to fatigue of the mind.** As a result, you will lose your 100% focus. Thus all your hard work is wasted. Hence **avoid last minute revision.** Ensure you have eight hours of undisturbed sleep prior to the exam.

2. **Eating a healthy and balanced diet** plays an important part as well. Avoid eating junk food weeks before your exam. Instead eat fresh fruits and vegetables.

3. **Avoid watching TV or playing computer games** on the night prior to your exam. This can corrupt your memory.

4. Ensure you **have your stationery items, mathematical instrument and calculator with battery all ready** at least one week before your Maths paper. Do not look for these items in the morning of your exam. Unavailability of these items could lead to panic prior to your exam.

5. **Remember practice does not make perfect but quality practice makes perfect.** No point you have tonnes of assessment books to practice but in the end you do not learn anything from your mistakes. Instead, it would be more effective you have an assessment book and every question, you keep reflecting to yourself why you have that particular question wrong.

6. **Check your answers and solutions** once you have completed the paper. Checking means you do not just look at your answers but you do it again. You are given a specific time to complete each of your paper. So ensure that you make full use of the allocated time. Never feel complacent, thinking that the paper is an easy one and rest/sleep for the rest of the duration of the exam. Complacent often leads to regret. In fact, you must keep checking until the time is up. There is a reason why you are given the allocated time to complete the paper and sleeping is not one of them.

7. Lastly before the start of any question, take a deep breath to remain calm and focus.