SA2

NAN HUA PRIMARY SCHOOL
PRELIMINARY EXAMINATION – 2021
PRIMARY 6

MATHEMATICS
PAPER 1
(BOOKLET A)

Total Time for Booklets A and B: 1 hour

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not turn over the page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Shade your answers in the Optical Answer Sheet (OAS) provided for Questions 1-15.
6. The use of calculators is **NOT** allowed.

Name : _____ ( )

Class : 6_____

Date : 19 August 2021 **Parent's Signature :**_____

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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 and shade your answer (1, 2, 3 or 4) on the Optical Answer Sheet.

(20 marks)

1. Round 35 896 to the nearest hundred.

   (1) 35 000

   (2) 35 800

   (3) 35 900

   (4) 36 000

2. What is the value of 3 hundreds, 4 tenths and 5 thousandths?

   (1) 0.345

   (2) 300.405

   (3) 340.005

   (4) 5300.4

3. Arrange the following numbers from the smallest to the largest.

6.306	6.036	6.36

	Smallest				Largest
(1)	6.036	,	6.306	,	6.36
(2)	6.36	,	6.036	,	6.306
(3)	6.36	,	6.306	,	6.036
(4)	6.036	,	6.36	,	6.306

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4. What is the value of $0.3 \div 60$?

(1) 0.005

(2) 0.02

(3) 0.05

(4) 0.5

5. Simplify the following algebraic expression.

$17d + 15 - 3d - 6$

(1) $14d + 9$

(2) $14d + 21$

(3) $20d + 9$

(4) $20d + 21$

6. What is the approximate mass of a school bag?

(1) 8 g

(2) 8 kg

(3) 80 g

(4) 80 kg

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7. Which of the following is the same as 40 175 cm?

(1) 4 m 175 cm

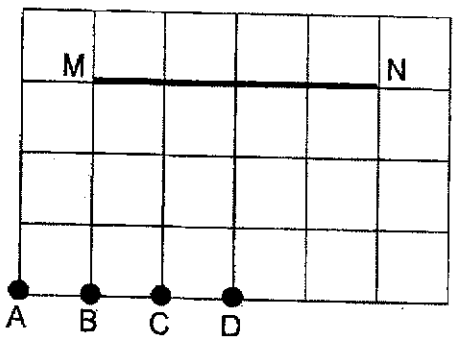
(2) 40 m 175 cm

(3) 401 m 75 cm

(4) 4017 m 5 cm

8. A, B, C and D are points on a square grid.

Which point when joined to M and N forms an isosceles triangle?



(1) A

(2) B

(3) C

(4) D

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*Use the information below to answer Questions **9** and **10**.*

The table below shows the number of members in a club for the years 2020 and 2021.

	2020	2021
Number of boys	60	40
Number of girls	40	50
Total	100	90

9. What is the ratio of the number of boys to the total number of members for the year 2020?

(1) 3 : 5
(2) 4 : 9
(3) 6 : 19
(4) 10 : 19

10. What is the percentage increase in the number of girls from 2020 to 2021?

(1) 10%
(2) 20%
(3) 25%
(4) 50%

11. The journey from Sam's school to home is 35 minutes by car. Sam wants to reach home at 2.20 p.m. to catch his favourite television programme. What is the latest time Sam needs to be in the car to reach home on time?

(1) 01 45
(2) 13 45
(3) 02 55
(4) 14 55

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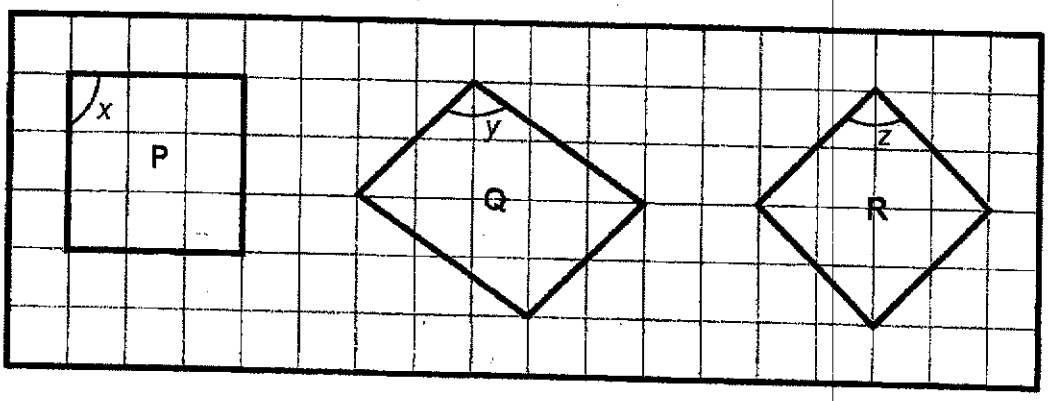
12. Three figures P, Q and R are shown in the square grid below.



Which of the following statements is true?

(1) $\angle x = \angle z$

(2) $\angle y = \angle z$

(3) Figure P has the same area as Figure R.

(4) Figure Q has the same perimeter as Figure R.

13. Mr Raj had 360 storybooks. He sold $\frac{2}{5}$ of them on Monday and $\frac{1}{3}$ of the remainder on Tuesday. How many books did he sell on Monday and Tuesday?

(1) 144

(2) 216

(3) 264

(4) 384

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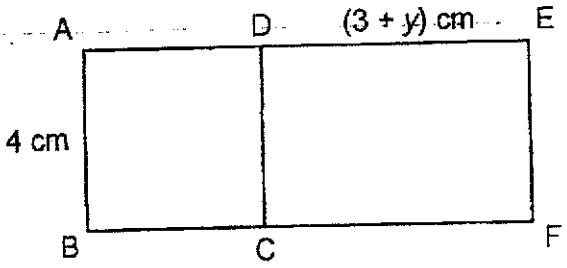
14. The figure is made up of a square ABCD and a rectangle CDEF. AB = 4 cm and DE = (3 + y) cm. What is the area of ABFE in square centimetres?



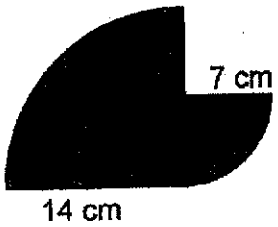
(1) $4 \times 7 + y$

(2) $4 \times 4 + 3 + y$

(3) $4 \times (4 + 3 + y)$

(4) $4 \times 4 + 4 \times 3 + y$

15. The figure below is made up of 2 quarter circles of radii 7 cm and 14 cm. What is the perimeter of the figure? Take $\pi = \frac{22}{7}$.



(1) 33 cm

(2) 44.5 cm

(3) 54 cm

(4) 61 cm

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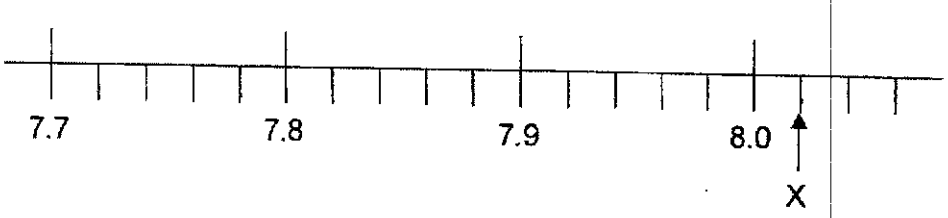
Questions **16** to **20** carry 1 mark each. Write your answers in the spaces provided. For questions which require units, give your answers in the units stated. [5 marks]

Do not write in this space

16. A handbag cost $96 after a discount of 20%. What is the original price of the handbag?

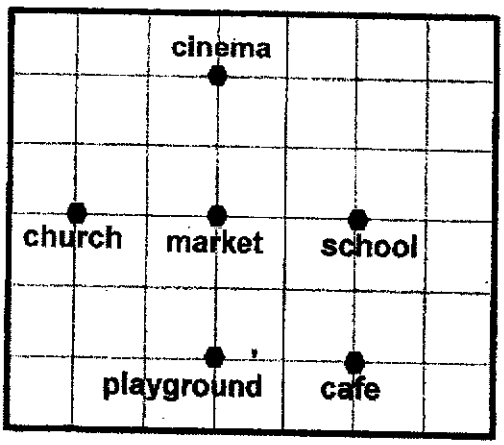
Ans : $ _____

17. Part of a scale is shown below. What is the value of X?



Ans : _____

18. In the square grid below, Meiqi is at one of the landmarks. She is facing the market. When she turns 45° anti-clockwise, she faces the school. Which landmark is Meiqi at?



Ans: _____

Subtotal	/ 3

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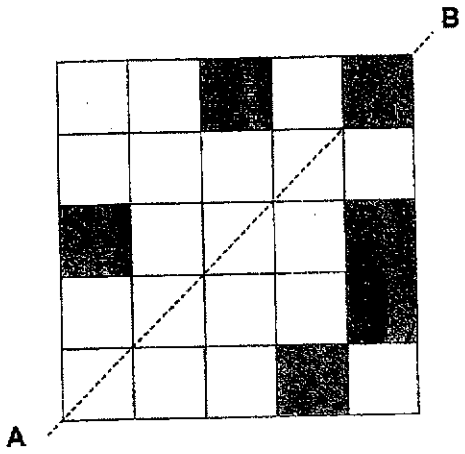
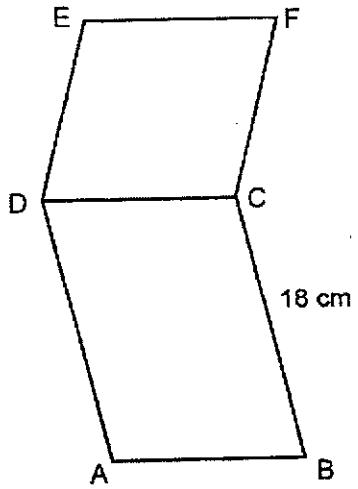
Do not write in this space

19. There are 6 shaded squares in the figure. Shade 3 more squares to form a symmetric figure with AB as the line of symmetry.



20. The figure below is made up of a parallelogram ABCD and a rhombus CDEF. The perimeter of the figure is 76 cm. BC = 18 cm. What is the perimeter of the rhombus CDEF?



Ans : _____ cm

Subtotal	/ 2

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NAN HUA PRIMARY SCHOOL
PRELIMINARY EXAMINATION – 2021
PRIMARY 6

MATHEMATICS
PAPER 1
(BOOKLET B)

Total Time for Booklets A and B: 1 hour

INSTRUCTIONS TO CANDIDATES

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

Marks Obtained

Paper 1	**Booklet A**		**/ 45**
	Booklet B		
Paper 2			**/ 55**
Total			**/ 100**

Name : _____ ( )

Class : 6_____

Date : 19 August 2021 **Parent's Signature:**_____

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

[20 marks]

Do not write in this space

21. Find the value of

a) $\frac{2}{5} \times 40$

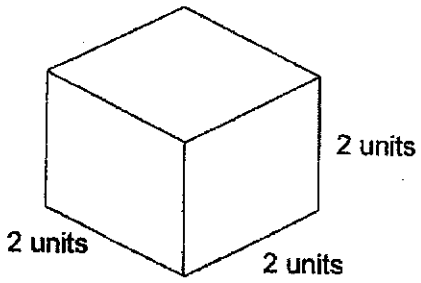
b) $21 \div \frac{3}{7}$

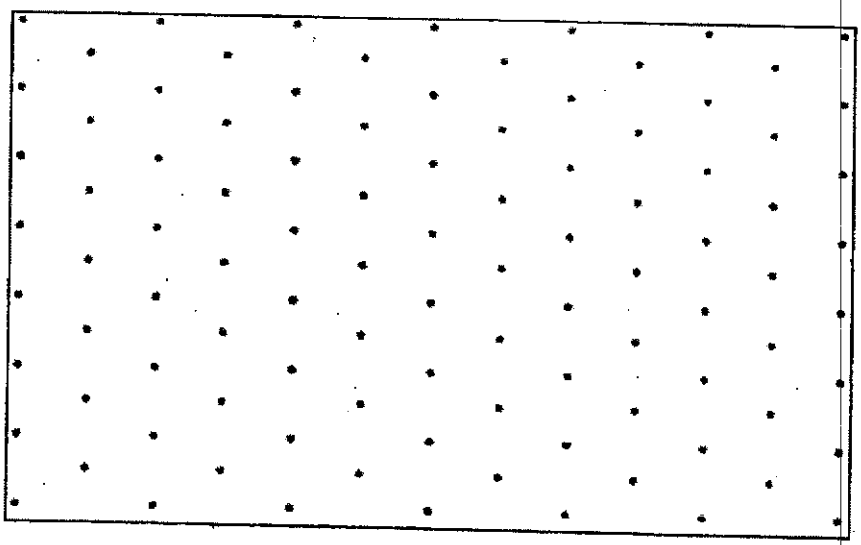
Ans: a) _____

b) _____

22. The figure below shows cube A. Cube A has a volume of 8 cubic units. Draw a cuboid with a volume of 12 cubic units in the isometric grid below.

Cube A





Subtotal	/ 4

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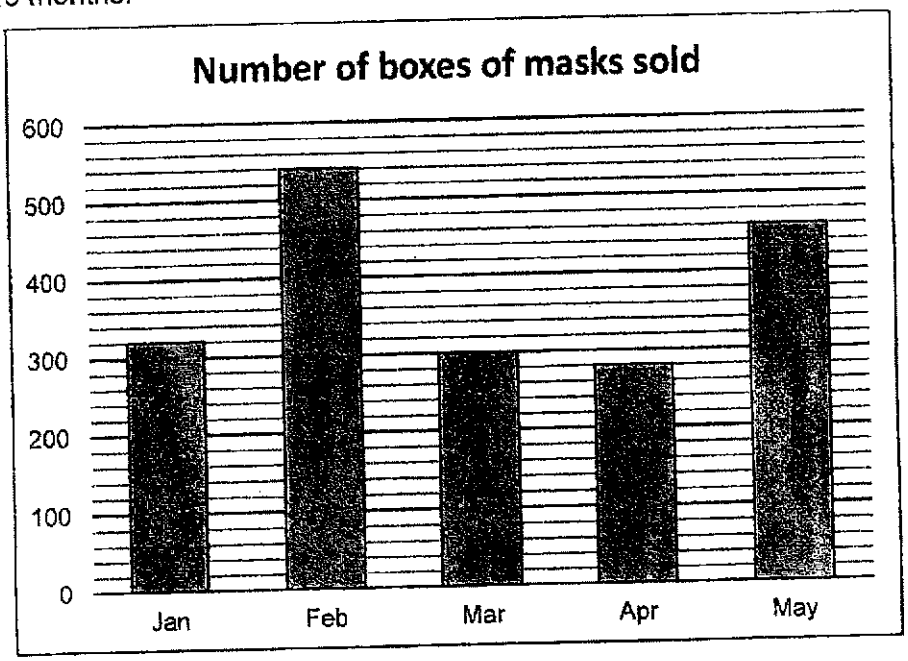
Do not write in this space

Use the information below to answer Questions ***23*** *and* ***24****.*

The graph below shows the number of boxes of masks sold in a pharmacy over 5 months.



23. What was the difference in the number of boxes of masks sold between the month with the highest sale and the month with the lowest sale?

Ans : _____

24. What was the average number of boxes of masks sold from Jan to May?

Ans : _____

Subtotal	/ 4

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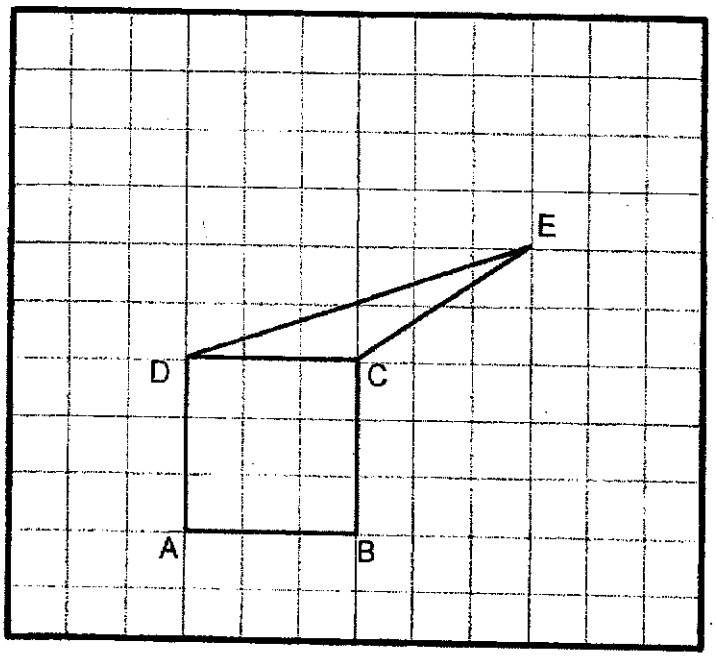
25. What is the missing number in the box?

$$\frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{\square} = 7 \times \frac{1}{12}$$

Do not write in this space

Ans : _____

26. A square ABCD and a triangle CDE are drawn on a square grid.



In the square grid,

a) draw a parallelogram BCEF.

b) draw another triangle DEG such that it has the same area as triangle CDE and does not overlap triangle CDE.

Subtotal	/ 4

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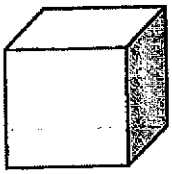
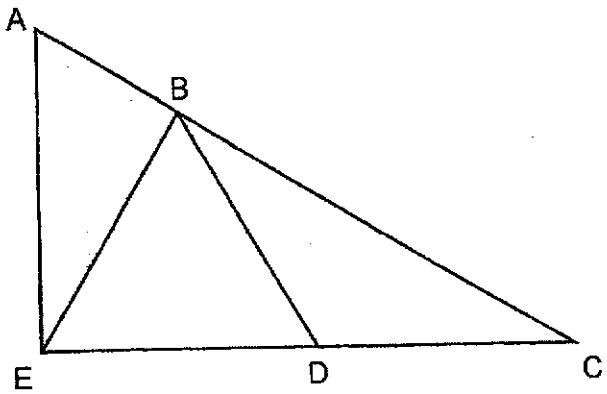
27. The perimeter of one face of a cube is 36 cm.
Find the volume of the cube.



Ans : _____ cm^3

28. In the figure, AEC is a right-angled triangle. BDE is an equilateral triangle. BCD is an isosceles triangle with BD = CD.



Each of the statements below is either true, false or impossible to tell from the information given. For each statement, put a tick (√) to indicate your answer.

Statement	True	False	Not possible to tell
ABE is a right-angled triangle.			
The area of BDE is smaller than the area of BCD.			

Subtotal	/ 4

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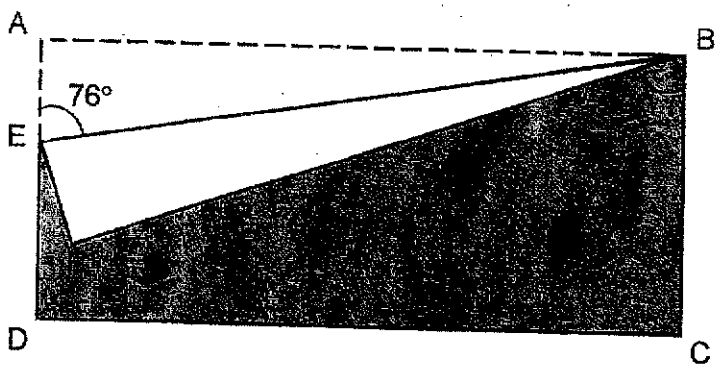
29. The average of three numbers is 62. The difference between the greatest number and the smallest number is equal to the middle number. What is the sum of the two smaller numbers?

Do not write in this space

Ans : _____

30. The figure below shows a rectangular piece of paper ABCD. It is folded along the line BE. ∠AEB = 76°. Find ∠FBC.



Ans: _____ °

Subtotal	/ 4

END OF PAPER

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PRELIMINARY EXAMINATION – 2021
PRIMARY 6

MATHEMATICS
Paper 2

Total Time for Paper 2: 1 hour 30 minutes

INSTRUCTION TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not turn over the page until you are told to do so.
3. Follow all instructions carefully
4. Answer all questions.
5. Write your answers in this booklet.
6. The use of an approved calculator is expected, where appropriate.

Marks Obtained

Total	Max Mark
	55

Name : _____( )

Class : 6_____

Date : 19 August 2021 Parent's Signature :_____

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

1. A jersey cost $26.35. A pair of shorts cost $2.55 less than the jersey. How much did a jersey and a pair of shorts cost?

Do not write in this space

Ans: $ _____

2. Three girls folded a total of 500 hearts for a charity project. Susan folded k hearts. Jiamin folded twice of what Susan folded and Rani folded 10 more hearts than Jiamin. How many hearts did Susan fold?

Ans: _____

3. The sum of the greatest and smallest factor of a number is 28. List out all the factors of this number.

Ans: _____

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4. In the figure, ABC is a straight line. ∠ABE = ∠CBE. Find ∠EBD.

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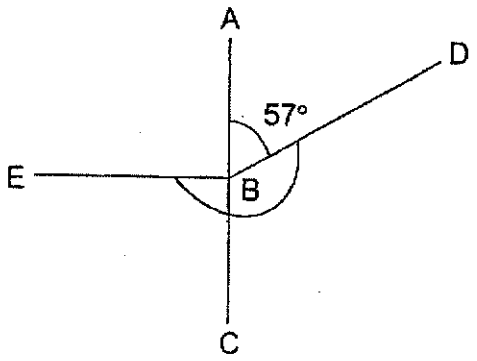
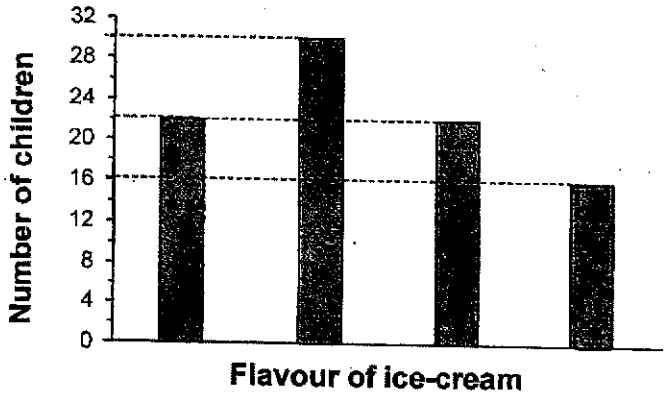


Ans: _____ °

5. A group of children were asked to choose one ice-cream flavour, Chocolate, Vanilla, Strawberry or Mango. The graph below shows the children's choices. The names of the flavours are not shown.



The same number of children chose Vanilla and Mango flavour. The number of children who chose Strawberry flavour was the least. What fraction of the children chose Chocolate flavour? Leave your answer in the simplest form.

Ans: _____

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For questions from **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)

Do not write in this space

6. A watch cost $315 at a sale after a discount of 30% excluding GST.

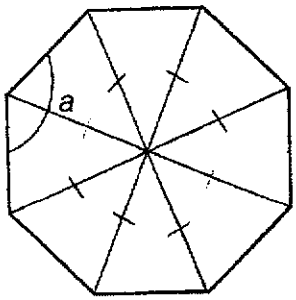
(a) What was the price of the watch before discount?

(b) Mr Tan bought the watch during the sale. How much did Mr Tan pay for the watch inclusive of 7% GST?

Ans: (a) _____ [2]

(b) _____ [1]

7. The figure below is made up of identical isosceles triangles. Find $\angle a$.



Ans: _____ [3]

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8. ABFG and BCDE are squares. Find the area of the shaded region.

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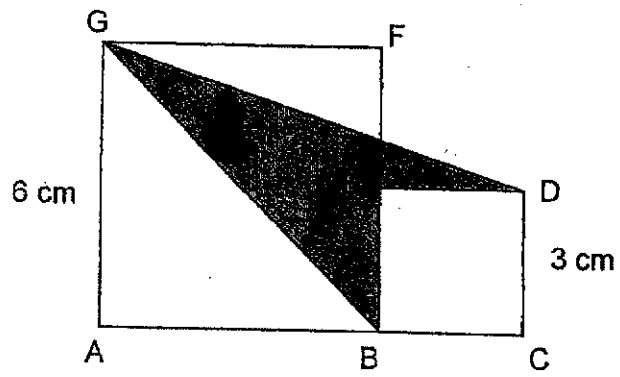

Ans: _____ [3]

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9. Beatrice had 396 green beads and some yellow beads at first. She used the same number of green and yellow beads to make a bracelet. The ratio of the number of green beads left to the number of yellow beads left was 3 : 5.

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

Statement	True	False	Not possible to tell
There were more yellow beads than green beads at first.			
The number of yellow beads at first was a multiple of 5.			

[2]

(b) If 60% of the beads were used, how many beads were there at first?

Ans: (b)_____ [3]

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10. The table below shows Raja's test scores for four different subjects. Part of the page had been torn off.

Do not write in this space

English	Chinese	Mathematics	Sc
72	81	9	

Raja's score for Science was 5 marks lower than his score for Mathematics.

(a) What was Raja's lowest possible score for Science?

(b) What was Raja's highest possible average score for the four subjects?

Ans: (a) _____ [1]

(b) _____ [3]

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11. Country A aims to vaccinate $\frac{2}{3}$ of her total citizens. 25% of the total citizens cannot be vaccinated due to medical reasons.

(a) What fraction of the citizens in Country A can go for vaccination?
(b) What fraction of the citizens who can go for vaccination needs to be vaccinated in order for country A to achieve her aim?

Ans: (a) _____ [1]

(b) _____ [2]

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12. The table below shows the parking charges at a car park.

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Time	Charge
8 a.m. to 6 p.m.	\$1.20 per $\frac{1}{2}$ hour
After 6 p.m.	\$3.00 per entry

(a) Mr Tan parked his car at the car park from 9.15 a.m. to 11.00 a.m. on the same day. How much did Mr Tan pay?

(b) Mr Lee left the car park at 9 p.m. He paid a total of \$12.60. What was the earliest possible time he entered the car park?

Ans: (a) _____ [1]

(b) _____ [2]

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13. The figure below is made up of straight lines and semi-circles of radii 6 cm and 8 cm. Using the calculator value of π,

(a) find the area of the figure.

(b) find the perimeter of the figure.
Round your answers to 2 decimal places.

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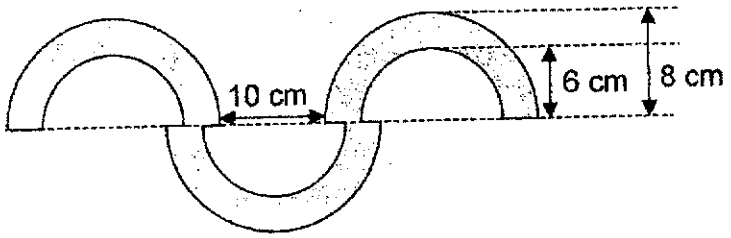

Ans: (a) _____ [2]

(b) _____ [3]

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14. A pack of trading cards contained 7 normal cards and 2 special cards. Weihua and John each bought a box of 40 packs of card. After opening their cards, they decided to trade with each other for the cards they wanted. 3 normal cards were traded for each special card. After trading, Weihua was left with a total of 384 cards.

Do not write in this space

(a) How many cards did John have in the end?

(b) How many special cards did Weihua have in the end?

Ans: (a) _____ [2]

(b) _____ [2]

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15. A tank was filled with some water. A tap was turned on and water flowed into the tank at a constant rate. After some time, another tap was turned on. Both taps were turned off after the tank was filled to the brim. The line graph shows the volume of water in the tank over this period of time.

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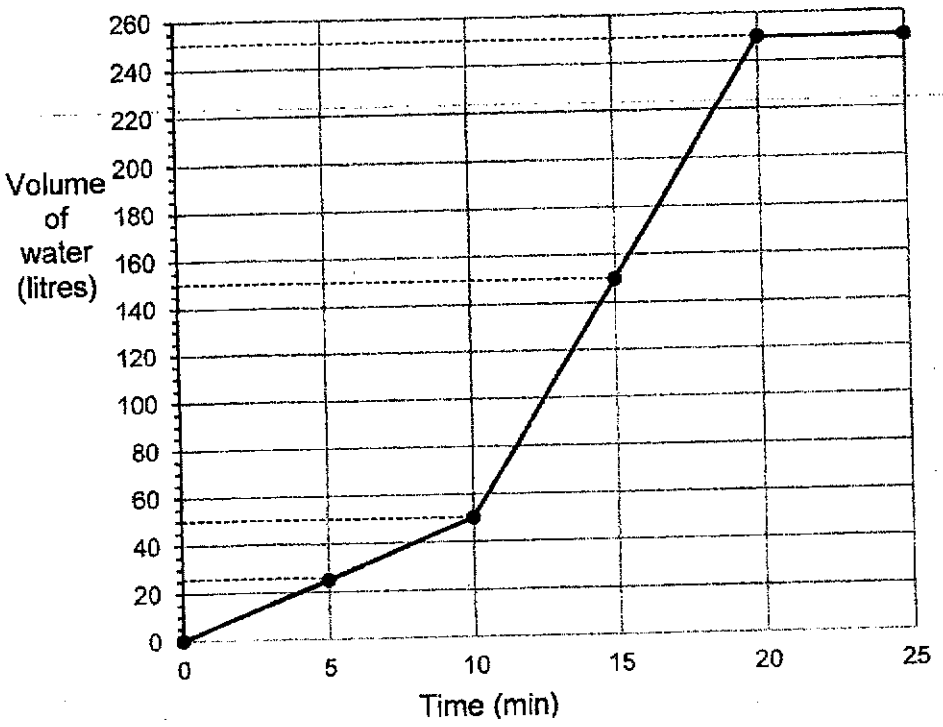

(a) At which minute was the second tap turned on?

(b) How many litres of water flowed out from the second tap every minute?

Ans: (a) _____ [1]

(b) _____ [2]

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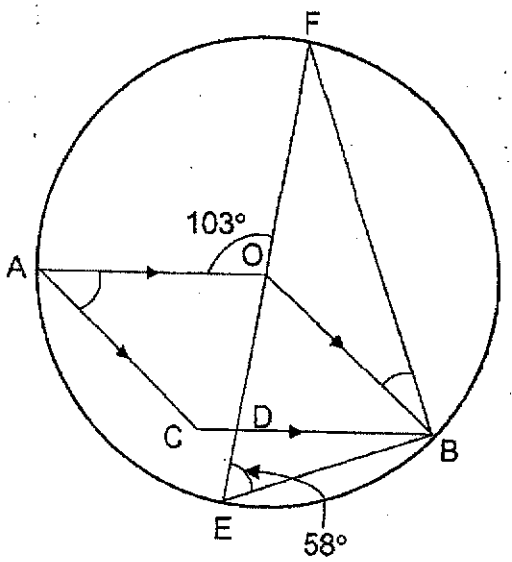
16. In the figure below, Point O is the centre of the circle.
EOF is a straight line. AOBC is a rhombus. ∠FEB = 58°. ∠AOF = 103°.

Do not write in this space



(a) Find ∠FBO.

(b) Find ∠OAC.

Ans: (a) _____ [3]

(b) _____ [1]

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17. White squares and black squares are used to form a pattern. The first four figures are shown below.

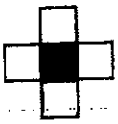

Figure 1

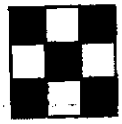

Figure 2

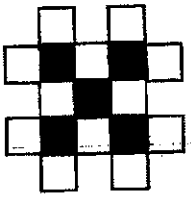

Figure 3

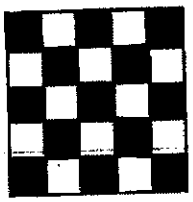

Figure 4

(a) The table below shows the number of white squares and black squares for the first four figures. Complete the table for Figure 5.

Figure Number	**1**	**2**	**3**	**4**	**5**
Number of black squares	1	5	5	13	13
Number of white squares	4	4	12	12	(i)
Total number of squares	5	9	17	25	(ii)

(b) How many white squares are there in figure 10?

(c) A figure in the pattern has a total of 441 black and white squares. What is the Figure Number?

Ans: a) (i) _____

(ii) _____ [1]

b) _____ [2]

c) _____ [2]

--------- End of Paper 2 ---------

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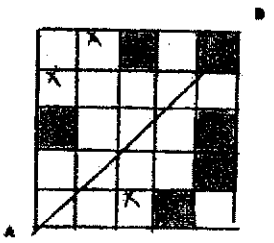
2021 NHPS Math Prelim Answers

Paper 1

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

Section B (20 marks)

16)	**120**
17)	**8.02**
18)	**cinema**
19)	**see picture**
20)	**40**



21. a) **16**

    b) **49**

22. Any cuboids with dimensions $2 \times 2 \times 3$ or $1 \times 4 \times 3$ or $1 \times 2 \times 6$

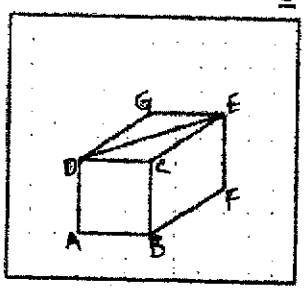
23. $540 - 280 = \underline{\mathbf{260}}$

24. $320 + 540 + 300 + 280 + 460 = 1\,900$

$$\frac{1\,900}{5} = \underline{\mathbf{380}}$$

25. $\frac{7}{12} - \frac{3}{12} = \frac{4}{12} = \frac{1}{3}$

26. **3**



27. $36 \div 4 = 9$

    Vol = 9 cm x 9 cm x 9 cm = **729 cm³**

28.

Statement	True	False
ABE is a right-angled triangle.	√	
The area of BDE is smaller than the area of BCD.		√

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29. Total of the 3 numbers = 62 × 3
= 186

Let the 3 numbers be S, M and L. L = M + S
Sum of 2 smaller numbers = 186 ÷ 2 = **93**

30. ∠ABE = 90° – 76° = 14°
∠FBC = 90° – 14° – 14° = **62°**

Paper 2

1.	26.35 – 2.55 = 23.80 26.35 + 23.80 = **50.15**
2.	$k + 2k + 2k + 10 = 500$ $5k = 490$ $k = 490 \div 5 = \mathbf{98}$
3.	Number → 28 – 1 = 27 **1, 3, 9, 27**
4.	∠ABE = ∠CBE = 90° ∠EBD = 360° – 90° – 57° = 213° Or ∠CBD = 180° – 57° = 123° ∠EBD = 90° + 123° = 213°
5.	Total → 22 + 30 + 22 + 16 = 90 $\frac{30}{90} = \frac{1}{3}$
6. (a) (b)	70% of price = $315 100% of price = $315 ÷ 70 × 100 = **$450** $\frac{107}{100} \times 315 =$ **$337.05**
7.	One angle at the centre = 360° ÷ 8 = 45° $\angle a$ = 180° – 45° = **135°**
8.	Draw a line to join points E and G. Area of ΔBEG = $\frac{1}{2} \times 3 \times 6 = 9$ Area of ΔDEG = $\frac{1}{2} \times 3 \times 3 = 4.5$ Shaded area = 9 cm² + 4.5 cm² = **13.5cm²** Or Extend GF, Area of big rectangle = 9 × 6

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$= 54$

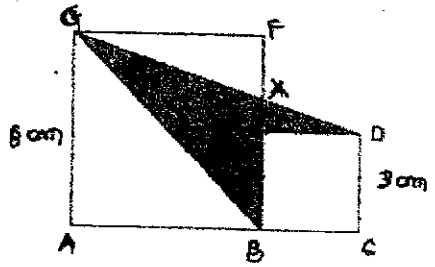
$(\frac{1}{2} \times 6 \times 6) + (\frac{1}{2} \times 9 \times 3) + (3 \times 3) = 40.5$

Shaded area = 54 – 40.5

= **13.5cm²**

Or

Using concept of similar triangles,



EX = 1 cm, BX = 4 cm

Area of $\Delta DEX = \frac{1}{2} \times 3 \times 1 = 1.5$

Area of $\Delta BGX = \frac{1}{2} \times 4 \times 6 = 12$

Shaded area = 12 cm² + 1.5 cm²

= **13.5cm²**

9.

(a)

Statement	True	False	Not possible to tell
There were more yellow beads than green beads at first.	√ (A1)		
The number of yellow beads at first was a multiple of 5.			√ (A1)

(b)

100% – 60% = 40%

3 : 5 = 15 : 25

Green at first → 30% + 15%

= 45%

45% of beads = 396

100% of beads = 396 ÷ 45 × 100

= **880**

Or

Green : yellow = 3 : 5

8 units = 40% of total

2 units = 10% of total

20 units = 100% of total

(used) 12 units = 60% of total

(green used) 12 units ÷ 2 = 6 units

(green total) 6 units + 3 units = 9 units

9 units = 396

20 units = 396 ÷ 9 × 20 = **880**

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10. (a)	Lowest poss score for Science → 90 – 5 = **85**
(b)	Highest poss for Mathematics → 99 Highest poss for Science → 94 Highest poss total → 99 + 94 + 72 + 81 = 346 Highest possible average → 346 ÷ 4 = **86.5** Or Highest poss for Mathematics → 99.5 Highest poss for Science → 94.5 Highest poss total → 99.5 + 94.5 + 72 + 81 = 347 Highest possible average → 347 ÷ 4 = **86.75**
11. (a)	Fraction of citizens eligible → 100% – 25% = 75% $= \frac{3}{4}$
(b)	Fraction needed → $\frac{2}{3} \div \frac{3}{4}$ or $\frac{8}{12} \div \frac{9}{12}$ $= \frac{2}{3} \times \frac{4}{3}$ $= \frac{8}{9}$
12. (a)	$1.20 \times 4 = \$4.80$
(b)	$12.60 - $3.00 = $9.60 $9.60 ÷ $1.20 = 8 (4 hours) 4 hours before 6 p.m. → **2 p.m.** or **14 00**
13. (a)	$1.5 \times \pi \times 6 \times 6 = 54\pi$ $1.5 \times \pi \times 8 \times 8 = 96\pi$ $96\pi - 54\pi = 42\pi \approx 131.95\ cm^2$ Or working on one semicircle first $32\pi - 18\pi = 14\pi$ $3 \times 14\pi \approx 131.95\ cm^2$
(b)	$1.5 \times 2 \times \pi \times 6 = 18\pi$ $1.5 \times 2 \times \pi \times 8 = 24\pi$ $18\pi + 24\pi + 8 = 42\pi + 8 \approx 139.95\ cm$
14. (a)	Total number of cards = 80 × 9 = 720 No. of cards John had in the end = 720 – 384 = **336**
(b)	Difference in cards for one trade = 3 – 1 = 2 384 – 720 ÷ 2 = 24

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	Number of special cards traded = 24 ÷ 2 = 12 Number of special cards left = 40 × 2 – 12 = **68**
15. (a)	**10**
(b)	First tap → 25 ÷ 5 = 5 First and second tap → (150 – 50) ÷ 5 = 20 Second tap → 20 – 5 = **15 litres** Or First tap: 5 min → 25 2 taps: 5 min → 150 – 50 = 100 Second tap: 5 min → 100 – 25 = 75 1 min → 75 ÷ 5 = **15 litres**
16. (a)	∠EOB = 180° – 58° – 58° = 64° ∠FOB = 180° – 64° = 116° ∠FBO = (180° –116°) ÷ 2 = **32°** Or ∠EBF = 90° ∠OFB = 180° – 58° – 90° = **32°** ∠DOA = 360° – 103° – 116° = 141°
(b)	∠OAC = 180° – 141° = **39°**
17. (a)	(i) 24 (ii) 37
(b)	odd pattern → white $[1 + 2 + \ldots + (\frac{n+1}{2})] \times 4$ even pattern → black $(1 + 2 + \ldots + \frac{n}{2}) \times 4 + 1$ total (odd) → $(n + 1)^2 + 1$ total (even) → $(n + 1)^2$ 12 + 12 + 16 + 20 = **60** Or Use formula: (1 + 2 + 3 + 4 + 5) × 4 = **60**
(c)	441 = 21 × 21 Figure Number = 21 – 1 = **20**

END

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