



INTERNATIONAL SINGAPORE MATHS COMPETITION 2017 (Primary 5)

1 hour 30 minutes

Instructions to participants

1. Do not open the booklet until you are told to do so.
2. Attempt ALL 25 questions.
3. Write your answers neatly in the Answer Sheet provided.
4. Marks are awarded for correct answers only.
5. All figures are not drawn to scale.
6. Calculators may be used.

Questions in Section A carry 2 marks each, questions in Section B carry 4 marks each and questions in Section C carry between 6 to 10 marks each.

Jointly organised by



Section A:

Each of the questions 1 to 10 carries 2 marks.

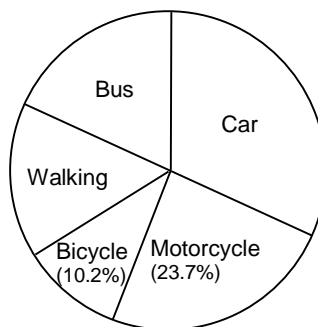
1. Given that $3^2 = 3 \times 3$ and $3^3 = 3 \times 3 \times 3$, what is the last digit of the answer for 6^{32} ?

2. I have 5 similar cups of 5 different colours – Red, Blue, Green, Yellow and Orange. I also have 3 similar saucers of 3 different colours – White, Black and Purple. How many different ways can I choose 2 sets of cups and saucers?

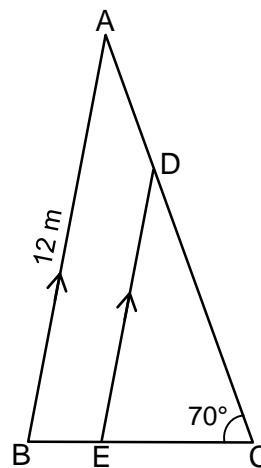


3. In an aquarium, each shrimp can see an equal number of other shrimps and seahorses but each seahorse can see twice as many shrimps as other seahorses. How many shrimps and how many seahorses are there in the aquarium?

4. Study the given Pie-chart. What is the difference in the percentage of students who went to school on a motorized vehicle and those who did not?



5. In the given figure not drawn to scale, $DC = 2 \times AD$, and $AB = 12$ m. Find the length of DE .



6. What is the date that is in the middle of the whole year of 2017?

7. It takes 4 chefs 3 hours to prepare a banquet. How long will it take 6 chefs to prepare the banquet if all the chefs are working at the same rate?

8. Five people are lined up according to their height. The first person is 1.8 m tall. Each subsequent person is 10% shorter than the person before. What is the height of the last person? Round off your answer to 2 decimal places.

9. If the diagonal of a large square is twice as long as the diagonal of a small square, express the area of the small square as a fraction of the area of the large square.

10. The *digit-sum* of a number is the sum of all the digits that make up the number. For example, the *digit sum* of 98 is $9 + 8 = 17$. How many whole numbers between 20 and 200 have an even *digit-sum*?

Section B

Each of the questions 11 to 20 carries 4 marks.

11. The product of two numbers is 756. If one of the numbers is between 55 and 83, what is the other number?

12. Three gifted musicians, Thomas, Harry and Johnny, can play any of three instruments – the guitar, the flute and the piano. The three of them are deciding who will play which instrument for tonight's performance.

If Thomas plays the flute, Harry will play the guitar.

If Thomas plays the piano, Harry will play the guitar.

If Harry plays either the flute or the guitar, Johnny will not play the piano.

If Johnny does not play the piano, Thomas will also not want to play the piano.

Who is playing which instrument tonight?

Thomas will play the _____.

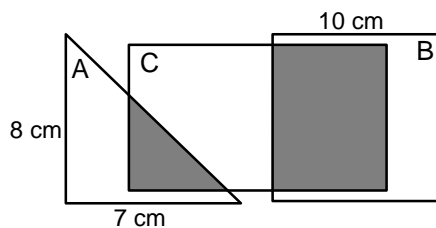
Harry will play the _____.

Johnny will play the _____.

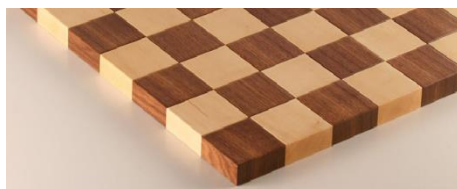
13. There are thrice as many apples in Bag A as Bag B. There are twice as many green apples as red apples in each bag. The average mass of each green apple is 0.6 kg while the average mass of each red apple is 0.8 kg. If the total mass of all the apples from both bags is 96 kg, how many red apples are there in Bag A?
14. In an examination taken by 4000 candidates, 2200 of them were boys and the rest were girls. If 45.5% of the students passed and 40% of the girls passed, what percentage of the boys passed?
15. Ted has thrice as many gummy bears as Esther.
He gave 189 gummy bears to Esther.
Esther then gave $\frac{1}{3}$ of her gummy bears to her sisters.
Now Esther has the same number of gummy bears as Ted.
How many gummy bears does Esther have in the end?

16. I am thinking of a number. The sum of its digits is 6 and none of its digits is 0.
When I add 20 to the number, the answer is an even number.
When I add 21 to the number, it becomes a multiple of 111.
What number am I thinking of?
17. The average of 77 consecutive numbers is 77. What is the average of the seven largest of these numbers?
18. When the time on the clock is exactly 3 o'clock, the minute hand and the hour hand form a right angle. What is the acute angle between the two hands at 10:45?

19. Triangle A is a right-angled triangle. One side of it is 7 cm and the other side is 8 cm. The length of the side of Square B is 10 cm. The total area of the shaded parts is 60 cm^2 . The total area of the figure is 200 cm^2 . What is the area of Rectangle C?



20. A square game board has dark squares at its four corners, then alternating with light squares throughout the board. There are 4% fewer light squares than dark squares. If the length of each square is 1 unit, what is the length of one side of the game board?



Section C

Questions 21, 22, 23, 24 and 25 carry 6, 7, 8, 9 and 10 marks respectively.

21. Suriah made two fractions with all the digits from 0 to 9, using each digit once. The sum of the two fractions is exactly 1. If one of the fractions she made was $\frac{1}{2}$ using the digits 1 and 2, what is the digit sum of the numerator of other fraction that is made up of the remaining eight digits?
22. Alina and Adam had some stickers in the ratio of 3 : 5. When Alina bought 42 more stickers and Adam bought 7 more stickers, the ratio became 6 : 7. Find the number of stickers Alina had at first.

23. In a KenKen 5-by-5 puzzle, the digits 1, 2, 3, 4 and 5, are used to fill the spaces in the grid so that no digit appears more than once in any row or any column, and the digits inside the cells (marked by darker lines) add up to the number given inside the cell.

Example:

⁶ 1	⁹ 5	4	⁷ 3	³ 2
5	¹⁰ 3	2	4	1
3	4	³ 1	2	⁹ 5
³ 2	1	⁸ 3	5	4
⁶ 4	2	5	⁴ 1	3

For the puzzle below, one of the spaces has been filled for you. Fill in all the remaining spaces.

¹²			⁶	³
¹⁰		⁶		
			⁶	⁷
⁹		⁶		
	² 2		⁸	

24. Given that $625^2 = 625 \times 625$ and $625^3 = 625 \times 625 \times 625$, what is the digit in the Ten Thousands place of the answer for 625^{11} ?

25. a) How many numbers are there between 2000 and 3000 where the digit in the Thousands place is equal to the sum of the other three digits?

b) How many numbers are there between 6000 and 7000 where the digit in the Thousands place is equal to the sum of the other three digits?

ROUGH WORKING