ENRICH BEYOND CLASS ROOM
SESSION -1

Mathematics M.M: 25
Time:1 Hour

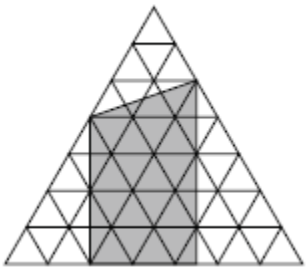
1 If θ *and* $\theta + 36°$ *are* acute angles and $sin(\theta + 36°) = cos\theta$ find the value of θ. (1)

A) 36° B) 54° C) 27° D) 22°

2 A ticket is drawn at random from a bag containing tickets numbered from 1 to 40. Find the probability that the selected ticket has a number which is a multiple of 5. (1)

A) $\frac{1}{5}$ B) $\frac{7}{40}$ C) $\frac{1}{7}$ D) $\frac{6}{41}$

3 In the diagram, the small equilateral triangles have area 4 cm^2 . What is the area of the shaded region? (1)

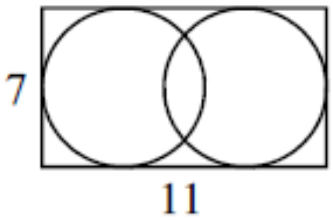


A) 80 cm^2 B) 90cm^2
C) 100cm^2 D) 110cm^2

4 What is the unit digit of the number? $2015^2 + 2015^0 + 2015^1 + 2015^5$ (1)

A) 1 B) 6 C) 5 D) 7

5 The diagram shows a rectangle of size $7\ cm \times 11\ cm$ containing two circles that each touch three of the sides of the rectangle. What is the distance between the centres of the circles? (1)



A) 5 cm B) 4 cm C) 2 cm D) 3 cm

6 The radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. Find the ratio of their volumes. (1)

A) 2 : 7 B) 5 : 9 C) 20 : 27 D) 20 : 9

7 If the sum of first m terms of an AP is $2m^2 + 3m$, then what is its second term? (1)

A) 6 B) 9 C) 8 D) None of these

8 What is the value of $\frac{2021 + 2021 + 2021}{2021 + 2021 + 2021 + 2021 + 2021}$? (1)

A) $\frac{1}{2}$ B) $\frac{3}{5}$ C) $\frac{1}{2021 + 2021}$ D) $\frac{1}{2022}$

9 Adding four of the five fractions $\frac{1}{2}, \frac{1}{3}, \frac{1}{6}, \frac{1}{9}, \frac{1}{18}$ gives a total of 1. Which of the fraction is not used ? (1)

A) $\frac{1}{6}$ B) $\frac{1}{2}$ C) $\frac{1}{18}$ D) $\frac{1}{3}$

10 One of the following number is prime . Which is it? (1)

A) 2018 – 3 B) 2018 – 2 C) 2018 – 1 D) 2018 + 1

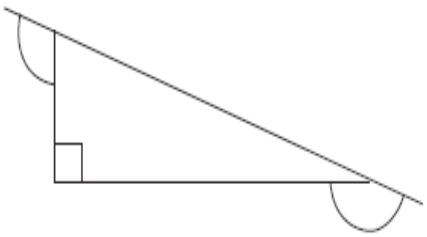
11. What value of x makes the mean of the first three numbers in this list equal to the mean of the last four? 15, 5, x, 7, 9, 17. (1)

A) 18 B) 17 C) 19 D) None of these

12 Which of the following calculations gives the largest answer? (1)

A) 1 − 2 + 3 + 4 B) 1 + 2 − 3 + 4 C) 1 + 2 + 3 − 4 D) 1 + 2 − 3 − 4

13 The triangle in the diagram contains a right angle. What is the sum of the other two marked angles on the diagram? (1)



A) 270° B) 250° C) 230° D) 260°

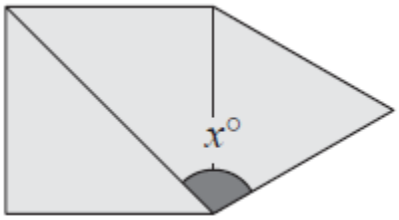
14 How many integers are greater than 20 + 18 and also less than 20 × 18? (1)

A) 320 B) 321 C) 322 D) 319

15 Find the distance between the points $(a\ cos\ 35°, 0)$ and $(0,\ a\cos 55°)$. (1)

A) a B) a^2 C) $2a^2$ D) None of these

16 The diagram shows an equilateral triangle, a square, and one diagonal of the square. What is the value of x ? (1)



A) 90° B) 105° C) 60° D) 120°

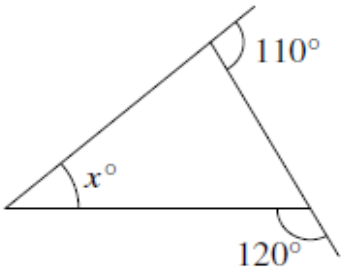
17 If $\frac{4^7+4^7+4^7+4^7}{2^7+2^7} = 2^x$ then x = ? (1)

A) 4 B) 8 C) 6 D) 1

18 What is the ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height? (1)

A) 2 : 1 : 2 B) 3 : 1 : 3 C) 3 : 1 : 2 D) 3 : 1 : 1

19 What is the value of x in this triangle? (1)



A) 55° B) 40° C) 50° D) 70°

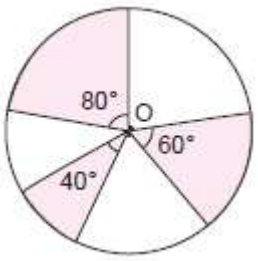
20 What is the sum of 25 % of 2020 and 2020 % of 25? (1)

A) 1020 B) 1120 C) 2020 D) 1010

21 A cube of side 4 cm contains a sphere touching its faces. Find the volume of the gap in between. (1)

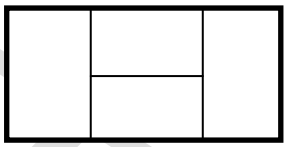
A) $64\left(\frac{6-\pi}{3}\right)$ B) $32\left(\frac{2-\pi}{3}\right)$ C) $32\left(\frac{3-\pi}{3}\right)$ D) None of these

22 In the given figure, three sectors of a circle of radius 7 cm, making angles of 60°, 80° and 40° at the centre are shaded. The area of the shaded region (in cm^2) is_____. (Use $\pi = \frac{22}{7}$) (1)



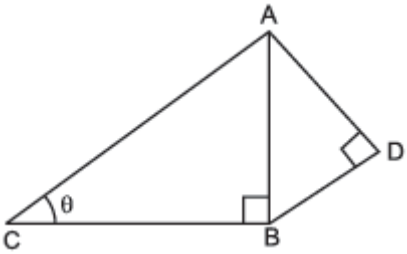
A) 77 B) 154
C) 44 D) 22

23 Four identical small rectangles are put together to form a large rectangle as shown. The length of a shorter side of each small rectangle is 10 cm. What is the length of a longer side of the large rectangle? (1)



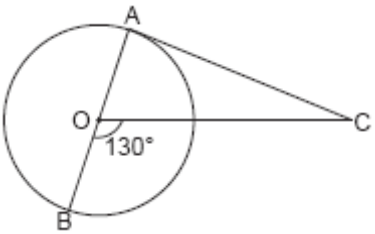
A) 20 B) 30 C) 40 D) 50

24 In the given figure, AD = 4 cm, BD = 3 cm and CB = 12 cm, find cot θ. (1)



A) $\frac{5}{12}$ B) $\frac{12}{13}$ C) $\frac{5}{13}$ D) $\frac{12}{5}$

25 In figure, AOB is a diameter of a circle with centre O and AC is a tangent to the circle at A. If ∠ BOC = 130°, then ∠ ACO = ___ (1)



A) 50° B) 60° C) 30° D) 40°