(Pages : 6)

427

Sl. No. 171179

S.S.L.C. EXAMINATION, MARCH-2012

MATHEMATICS (English)

Time : 2½ Hours Total Score : 80

Instructions :

- Read the questions carefully, understand each question and then answer the questions.
- Give explanations wherever necessary.
- If there is an **OR** between any two questions, you may answer only one among them.
- **15** minutes will be given at the beginning as cool off time. This time may be utilised to read and understand the questions.
- Simplification using $\sqrt{2}$, π etc. with their approximate values is not required if not specified in the question.

Score

1. An arithmetic sequence starts as 5, 9, 13, ... What is the next term ? Is 2012 a term of this sequence ? Why ? 2

2. Draw x and y axes and mark the points (0, 4), (2, 5) and $(-3, -2)$. 2

3. Find the remainder on dividing the polynomial x^3-3x^2+5x+7 by $x-3$. 2

   Is $x-3$ a factor of this polynomial ? Why ?

4. There are two small boxes A and B. In A there are 9 white beads and 8 black beads. In B there are 7 white and 8 black beads. We want to take a bead from a box. 3

   (a) What is the probability of getting a white bead from each box ?

   (b) A white bead and a black bead are added to box B and then a bead is taken from it. What is the probability of getting a white bead from it.

   OR

   There are two covers A and B ; each containing paper slips with natural numbers from 1 to 7 written on them. One slip is drawn from each cover. Using them, a two digit number is formed with the number from A in the unit place and the number from B in the tenth place. How many such two digit numbers can be formed ? What is the probability that a two digit number so formed is even ?

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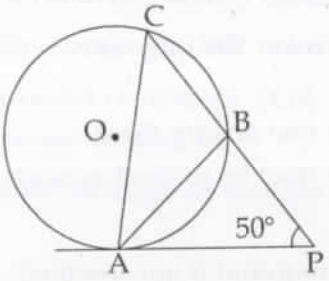
Score

5. A 34 cm long wire is bent in to a rectangle. The length of its diagonal is 13 cm. What are the lengths of the sides of the rectangle ? 3

6. In the figure, AP is a tangent to the circle and triangle APB is an isosceles triangle. Also $\angle APB = 50°$. Find the angles of triangle ABC and triangle APB. 3

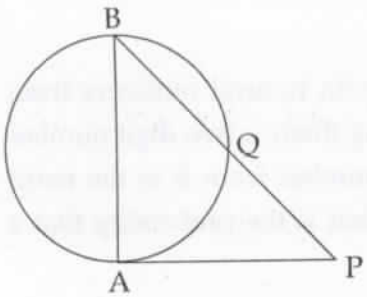


7. The table below shows the number of students in maths club of a school, classified according to their heights. 3

Height (cm)	Number of students
110 - 120	4
120 - 130	24
130 - 140	20
140 - 150	32
150 - 160	20

Calculate the mean height.

8. In figure, AB is a diameter and AP is a tangent to the circle. If PB = 9 cm and PQ = 4 cm, find the length of AP. What is the radius of the circle ? 3



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Score

9. Third term of an arithmetic sequence is 34 and its eighth term is 69. 4

(a) Find the common difference of this sequence

(b) Write the algebraic form of this sequence

(c) If a new sequence is formed by multiplying each term of the given sequence by 4 and adding 3, then what is the tenth term of that sequence ?

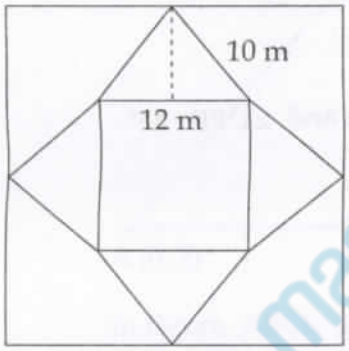
10. In triangle ABC, AB = 8 cm, AC = 5 cm and $\angle A = 50°$. Then 4

(a) What is the length of the perpendicular from C to AB ?

(b) Find the length of BC.

[$\sin 50° = 0.7660$, $\cos 50° = 0.6428$, $\tan 50° = 1.1918$]

11. Figure below shows the diagram drawn on a square sheet of paper for constructing a square pyramid. 4



What is the length of a side of the square sheet of paper taken ?

The figure drawn in the square paper is cut out and folded to make a square pyramid. What would be the height of that pyramid ?

12. What is the least three digit number, which is a multiple of 6 ? 4

Find the sum of all three digit numbers which are multiples of 6.

13. The radius of a wooden hemisphere is 10 cm. What is its volume ? 4

If this hemisphere is carved in to a cone of maximum size, find the volume of the cone.

OR

A metallic sector of central angle 240° and radius 15 cm is rolled up to form a cone. What is the volume of the cone so formed ?

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14. The table below shows the classification of the members of a committee, according to their age.

Age	Number of members
25 - 30	4
30 - 35	7
35 - 40	12
40 - 45	15
45 - 50	16
50 - 55	12
55 - 60	9
60 - 65	5

Calculate the median age of the members.

15. Draw an equilateral triangle of sides 5 cm. Construct a square having the same area as that of this triangle.

OR

In figure, AB and CD are diameters of the circle. Also AC = 4 cm and $\angle DPB = 45°$.

(a) Find $\angle DQB$.

(b) Find the radius of the circle.

16. Kichu and Sachu were on a morning walk. On reaching a junction, Kichu moved exactl East wards and Sachu moved exactly Northwards. Sachu was at a speed of 30 metres pe minute than Kichu. After 10 minutes the shortest distance between them was 1.5 kilometre

Draw a rough figure showing the position of Kichu, Sachu and the junction.

Calculate the distance covered by each. Find their respective speed.

OR

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Score

There are two taps opening in to a tank. If both are opened, the tank would be full in 18 minutes. The time taken for it to fill with only the large tap open is 15 minutes less than the time to fill with only the small tap open. What is the time taken to fill the tank only with the small tap open ?

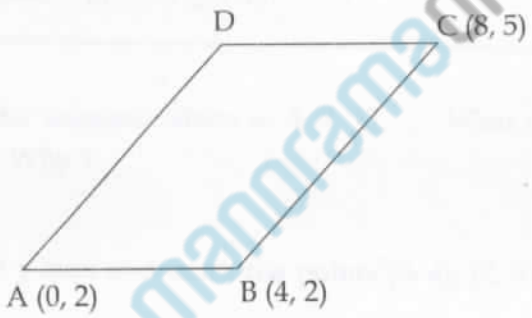
17. A boy, 1.4 metres tall, standing at the edge of a river bank sees the top of a tree on the edge of the other bank at an elevation of 55°. Standing back by 3 metres, he sees it at an elevation of 45°. 5

(a) Draw a rough figure showing these facts.

(b) How wide is the river and how tall is the tree ?

[sin 55° = 0.8192, cos 55° = 0.5736, tan 55° = 1.4281]

18. 5



In figure, ABCD is a parallelogram.

(a) Write the coordinates of D.

(b) What is the height of this parallelogram ?

(c) Find the perimeter and area of it.

19. Consider the polynomial p $(x) = x^2 + 6x + k$. 5

(a) Show that, if k = 10, this polynomial has no first degree factors.

(b) What should be the maximum value of k so that p (x) has a first degree factor ?

(c) Give any negative value for k. Write the resulting polynomial as a product of two first degree polynomials.

(d) Show that, for any negative value of k, p (x) has two distinct first degree factors.

Score

20. (a) Check whether the line $3x-2y+9$ pass through the point (1, 6). 5

(b) Write down the equation of the line through (3, 7) and of slope $\frac{3}{2}$.

(c) Show that the lines mentioned above are parallel.

21. Draw a circle of radius 3 centimetres. 5

(a) Draw triangle ABC with this circle as circum circle and angles 50°, 60°, and 70°.

(b) Construct triangle PQR, outside the circle, by drawing tangents to the circle at the points A, B and C.

(c) Find all angle of triangle PQR.

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