Sneha Saje
X : E
A
Sneha

FIRST TERMINAL EXAMINATION - 2012

MATHEMATICS

Standard : X

Score : 80
Time : 2½ hours

Instructions

- Answer the questions only after reading and understanding all questions.
- The first 15minutes are given as cool-off time.
- Give the explanations leading to the answer, wherever necessary.
- If any two questions have an "OR" in-between, only one of them need be answered.
- Unless otherwise specified, approximate values of numbers like π, $\sqrt{2}, \sqrt{3}$ and so on need not be used in the simplifications.

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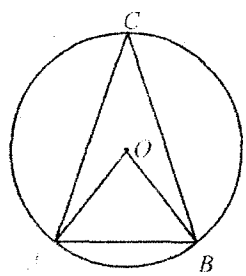
1. Write an arithmetic sequence with common difference 6. Is the difference between any two terms of this sequence equal to 60? (2)

2. A circle is drawn with AB as diameter. A point C is marked inside the circle. On drawing ΔABC and measuring $\angle C$, Remya got 70°, while Reena got 110° Which is the correct measure of $\angle C$? Why? (2)

3. If any integer is multiplied by 10 more than the number and then a special number added to the product, we get a perfect square. What is this special number? (2)

4. Write the sequence got by multiplying all natural numbers by 6 and adding 2 to each. What is its 15th term? (3)

5.



In the figure, O is the centre of the circle and A, B, C are points on the circle. Prove that $\angle ABC + \angle OAC = 90°$

6. The length of a rectangular garden is 8 metres more than twice its breadth. The area of the garden is 234 square metres. What is its breadth? (3)

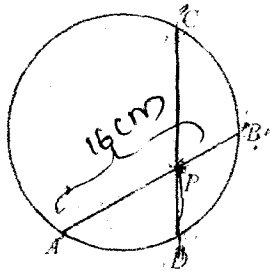
7. Draw a triangle with angles 30°, 110° and circumradius 4 centimetres. (3)

8. The 6th term of an arithmetic sequence is 40 and its 9th term is 61.

i) What is its common difference?

ii) Write the algebraic form of this sequence. (3)

9.



7 + 3
= 10

180 ×
3 2
540

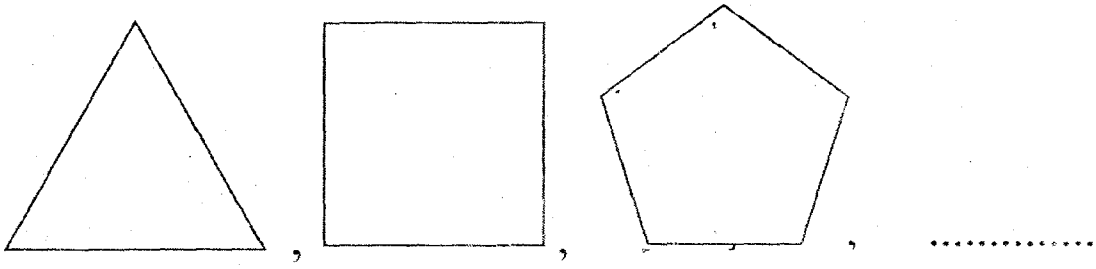
230 +
120
350

In the figure, chords AB and CD meet at P.

$AB = 16$ cm, $PB = 4$ cm and $PD = 3$ cm. Calculate AP and CD (3)

10. Ravi is trying to cut out a rectangular card of perimeter 60 centimetres and area 230 square centimetres. Will he succeed? Why? (3)

11. The figure below shows a sequence of regular polygons:



230 +
60
290

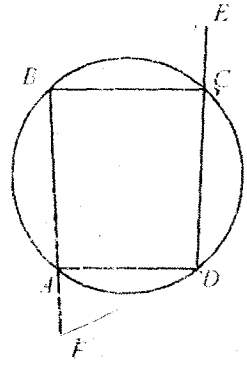
n-2 x 180
5-2 x 186
3 x 180

Riyaz wrote the measures of one angle of these polygons as a sequence. Niyaz wrote the sum of the angles of these polygons as a sequence.

a) Write both sequences.

b) Which of them is an arithmetic sequence? Why? (3)

12. In the figure below A, B, C, D are points on the circle. The points E, F are on the lines AB and CD extended.



Prove that $\angle BCE + \angle EAD = 180°$ (3)

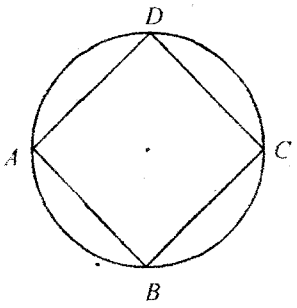
13. Three points on the edge of a semi circular sheet of diameter 16 centimetres are joined to cut out a right angled triangle. One of the angles of this triangle is 30°? Calculate the lengths of the sides of this triangle. (4)

14. A packet dropped from a helicopter drops down 5 metres in the first second. In the next second it falls 15 metres further, in the next another 25 metres and so on. In the last second, it falls 115 metres more and hits the ground.

a) How much time did it take to reach the ground?

b) How high the helicopter when the packet was released? (4)

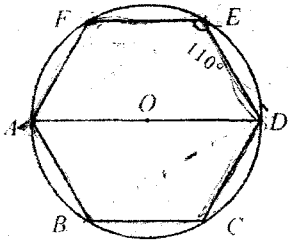
15. In the figure A, B, C, D are points on the circle and the line AC bisects both $\angle BAD$ and $\angle BCD$:



Prove that AC is a diameter of the circle.

OR

In the figure, AD is a diameter of the circle and AB, BC, CD are chords of equal length.



If $\angle DEF = 110°$, calculate the following.

a) $\angle AEF$

b) $\angle BAF$

c) $\angle BCD$ (4)

16. How many terms of the arithmetic sequence 7,11,15,...., starting from the first, must be added to get 592? (4)

17. Draw ΔABC with $AB = 5$cm, $\angle A = 60°$, $\angle B = 50°$ and construct a square of the same area. (4)

18. $\frac{19}{8}, \frac{22}{8}, \frac{25}{8}, \ldots$ is an arithmetic sequence.

a) Write the algebraic form of this sequence.

b) Which is the first natural number in this sequence?

c) Write the sequence of natural numbers in the given sequence. Is it an arithmetic sequence? (4)

19. The sum of the squares of two *consecutive* odd numbers is 290.

a) If an odd number is written as x, what is the next odd number?

b) Write the given fact as an equation and find the numbers. (4)

20. The sum of the 8th and 18th terms of an arithmetic sequence is 80.

a) What is the sum of its first and 25th terms?

b) Calculate the sum of its first 25 terms.

c) Find the 13th term of the sequence. (4)

21. An aluminium rod of length 40 centimetres is bent to form a right angled triangle. One of its perpendicular sides is 1 centimetre less than twice the other.

a) If the length of one of the perpendicular sides of the triangle is taken as x centimetres, what is the length of the other?

b) Write a second degree equation based on the given data and calculate the lengths of these sides.

OR

The maths teacher at Ganitapuram school is transferred to another school. The students of Class 10 decided to buy a book for 360 rupees as a gift for her. On the farewell day, 4 of the students did not turn up and so those present had to contribute an extra 1 rupee each. How many students are there in this class altogether? (5)

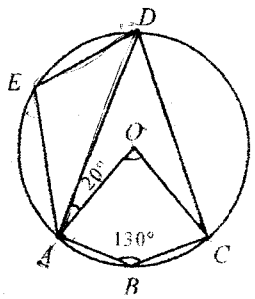
22. To dig a well, the first metre costs 1000 rupees and each addional metre costs 500 rupees more.

a) What is the cost of digging a 12 metres deep well?

b) For this well, how much more than the cost of digging the first 6 metres is the cost of digging the next 6 metres? (5)

23. In the figure below, O is the centre of the circle. A, B, C, D, E are points on the circle.

$\angle ABC = 130°$ and $\angle OAD = 20°$.



Find the following angles

a) $\angle ADC$

b) $\angle OCD$

c) $\angle AED$ (5)