339

SSLC MODEL EXAMINATION – FEBRUARY, 2015

MATHEMATICS

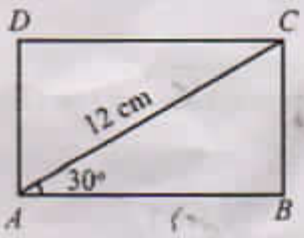
Time: $2^1/_2$ hours **Total Score: 80**

Instructions:

- Before answering each question, read the instructions carefully and understand the question.
- Answer should contain explanations wherever necessary.
- If there is an 'OR' between two questions, answer only one among them.
- First 15 minutes are allowed as cool off time. Read and understand the questions at this time.
- If it is not requested there is no need of simplification of the irrationals like $\sqrt{2}$, $\sqrt{3}$, π etc using their approximate value.

1. Write an arithmetic sequence with common difference 6, using the terms of the arithmetic sequence 5, 8, 11 ....? Write down the algebraic form of this sequence. (2)

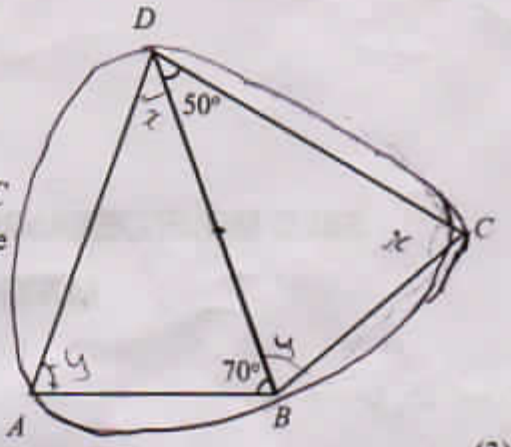
2. The slant height of a square pyramid with base area 576 square centimeters is 13 centimeters. What is the height of the pyramid? (2)

3. 

In the figure, $ABCD$ is a rectangle. AC = 12 = cm, $\angle BAC = 30°$. What is the area of the rectangle? (2)

4. Write down a second degree polynomial with three terms. What is the remainder when this polynomial is divided by $(x - 2)$? (2)

5. In the figure BD is common bisector $\angle ABC$ and $\angle ADC$. Check whether the circum circle of ΔBCD passes through A.



(3)

6. In a box there are 6 black beads and 9 white beads. In another box there are 3 black beads and 7 white beads. Without looking in to the box take one bead from each box.

(a) What is the probability of getting same colour beads?

(b) What is the probability of getting at least one black bead? (3)

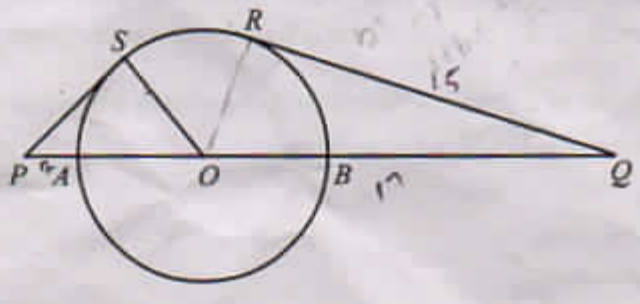
7. The product of two consecutive multiplies of 6 is 432. Which are the numbers?

(3)

OR

The area of a rectangle with perimeter 40 centimeter is 75 square centimeter. Find the length and breadth of the rectangle.

8.



In the figure O is the centre of the circle. PS, QR are tangents. OQ = 17 cm, QR = 15 cm, PA = 2 cm. Find the perimeter of ΔPOS.

(3)

9. Anu and Vinu wrote one arithmetic sequence each with the same common difference 7. The 5th term of Anu's sequence is equal to the 8th term of Vinu's sequence. Then

(a) What is the difference between the first terms of the two sequence?

(b) What is the difference between the sum of first 20 terms of the two sequences?

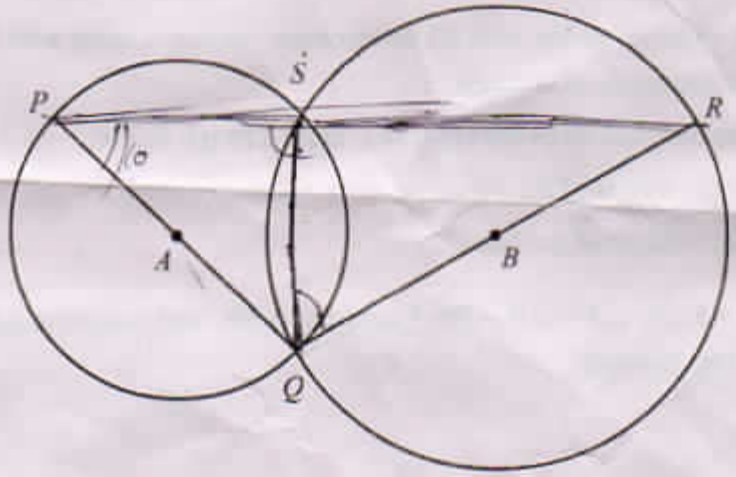
(3)

10. The table shows the weight of the members of the school Mathematics Club.

Weight (in kilogram)	Number of pupils
30 – 34	4
34 – 38	9
38 – 42	15
42 – 46	20
46 – 50	12
50 – 54	10
Total	70

What is the mean weight in kilogram? (3)

11.



In the figure two circles with centers at A and B intersect at Q and S. PQ and QR are diameters of the circles. Prove that P, S and R are points on the same line.

(3)

12. When a circle is drawn with centre at (6, 2) and radius 10, the circle intersects the Y-axis at the point A and B.

(a) Draw a rough figure showing the above facts.

(b) What are the co-ordinates of A and B? (3)

13. The height of a solid metal cone is twice its base diameter.

(a) If r is the radius of the cone, what is its height.

(b)If we melt the cone and recast into solid spheres with half the radius of the cone, how many such spheres can be made. (4)

14. In the polynomial $P(x) = x^3 + ax^2 + bx + c$, $P(0) = 3$. If $(x^2 - 1)$ is a factor of $P(x)$, find the value of a, b and c. (4)

OR

If $(x + 2)$ is a factor of $P(x) = (x - 2)(x + 3) + k$

(a) What is the value of k?

(b) Check whether $(x - 1)$ is a factor of $P(x)$.

(c) Which number is added to $P(x)$ to get a polynomial with $(x - 3)$ as a factor?

15. In a arithmetic sequence the sum of the first nine terms is 279 and the sum of the first twenty terms is 1280. Then,

(a) What is the 5th term of the sequence?

(b) What is the 16th term of the sequence?

(c) Write the sequence. (4)

16. From a solid wooden sphere with 13 centimeters radius, a cone with 18 centimeters height and maximum base is made.

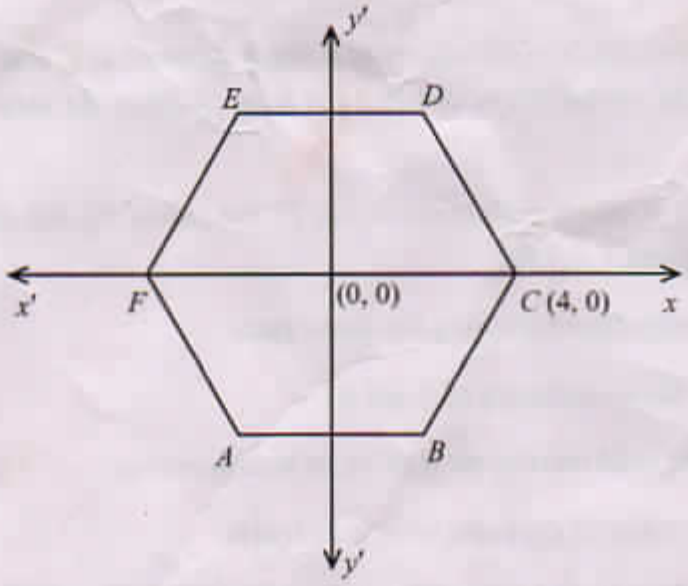
(a) Taking the base radius of the cone as r, draw a rough figure.

(b) Calculate the radius of the cone.

(c) What is the volume of the cone? (4)

17. In ΔABC, $AB = 5$ cm, $\angle A = \angle B = 70°$. Construct ΔABC and construct a square with the same area of this triangle. (4)

18.



In the figure $ABCDEF$ is a regular hexagon. If the co-ordinates of C are (4, 0), find the co-ordiantes of other vertices of the hexagon. (4)

19. The table shows the daily wages of workers of a company.

Daily wages (in Rupees)	Number of workers
100 – 150	3
150 – 200	7
200 – 250	12
250 – 300	15
300 – 350	10
350 – 400	9
400 – 450	4

(a) How many workers are there who get daily wage less than or equal to 300 rupees?

(b) Find the median of the daily wages. (4)

20. The radius of the circum circle of a triangle is 5 centimeters and the two angles of the triangle are 50°, 60° Construct the triangle and measure the length of the sides of the triangle. (5)

21. On the flat face of a cone, a hemisphere with same diameter is fixed and the total height of this solid is 23 centimeters. If the slat height of the cone is 17 centimeters which measure can be its radius and height?

(5)

OR

The students of a class decided to buy a clock worth Rupees 360 to the class. Meanwhile 5 moved to another school. So the remaining pupils look one rupee each additionally to buy the clock. Then how many students are there in the class now?

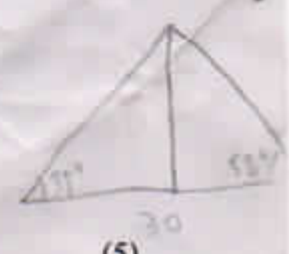
22. In a plain ground two students are standing on the two sides of a flag post standing perpendicular to the ground such a way that the students and the flag post are on the same line. The first student sees the top of the flag at an angle of elevation of 35° and the second student sees the top of the flag post at an angle of elevation of 58°. The distance between the students is 30 meters. Then,

(a) Draw a rough sketch and mark the given measures.

(b) Calculate the height of the flag post.

($\sin 35° = 0.574$ $\cos 35° = 0.82$ $\tan 35° = 0.7$

$\sin 58° = 0.848$ $\cos 58° = 0.53$ $\tan 58° = 0.6$



(5)

OR

The side of a rhombus is 10 centimetres and one angle is 37°

(a) What is the area of the rhombus?

(b) What is the length of the small diagonal?

(a) What is the length of the large diagonal?

($\sin 37^\circ = 0.6$, $\cos 37^\circ = 0.8$, $\tan 37^\circ = 0.754$)

23. (a) Write equation of the line through $A(3, 5)$, $B(1, 2)$. 2

(b) Write the co-ordinates of the point when the line $3x - 2y - 6 = 0$ cuts X axis. 1 ¼

(c) State in which of the above lines the point (4, 3) belongs. ½

(d) Is there any common point for the above two lines? Justify your answer. (5)