

**Guess Paper – 2014**  
**Class – X**  
**Subject – MATHEMATICS**

**Time allowed : 3 hours**

**Maximum Marks : 90**

**GENERAL INSTRUCTIONS**

1. All questions are compulsory.
2. The paper consists of 34 questions divided into four **sections A, B, C and D**.
3. **Section A** contains **8 MCQs** of **1 mark** each. **Section B** contains **6 questions** of **2 marks** each. **Section C** contains **10 questions** of **3 marks** each. **Section D** contains **10 questions** of **4 marks** each.
4. Question number **1 to 8** in **Section A** are multiple choice questions where you are required to select any one correct option out of the given four.
5. Use of **calculator** is **not** permitted.

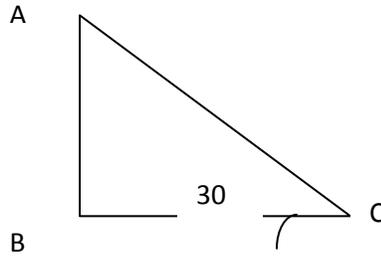
**SECTION-A**

***Question numbers 1 to 8 carry 1 mark each.***

1. A shuttle cock used for playing badminton has the shape of a combination of
  - (a) A frustum of cone and a hemisphere.
  - (b) A cylinder and a hemisphere.
  - (c) A sphere and a cone.
  - (d) A cylinder and a sphere.
2. The x- axis meets the line segment joining A(-1,4) and B(3, -7) at the point P. The point P divides AB in the ratio
  - (a) 2 : 3
  - (b) 4 : 7
  - (c) 5 : 7
  - (d) 2 : 7
3. Area enclosed between two concentric circles is 770 cm<sup>2</sup>. If the radius of the outer circle is 21 cm then the radius of the inner circle is
  - (a) 12 cm
  - (b) 13 cm
  - (c) 14 cm
  - (d) 15 cm.

4. In the given figure  $AB + BC = 10$  cm. the length of AB is equal to

- (a)  $\frac{20}{\sqrt{3} + 1}$
- (b)  $\frac{\sqrt{3} - 1}{30}$
- (c)  $\frac{\sqrt{3} + 1}{10}$
- (d)  $\sqrt{3} + 1$

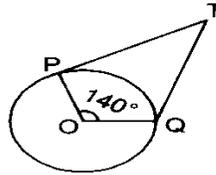


5. All spade cards from a pack of 52 cards are removed. One card is drawn at random from the remaining cards. The probability of getting a king is
- (a)  $1/13$
  - (b)  $2/13$
  - (c)  $3/13$
  - (d)  $4/13$
6. If two concentric circles are of radius 4 cm and 5 cm, then the length of the chord of one circle which touches the other circle is
- (a) 3 cm
  - (b) 6 cm
  - (c) 9 cm
  - (d) 12 cm
7. If the 17<sup>th</sup> term of an AP exceeds the 13<sup>th</sup> term of the AP by 15, then the common difference is
- (a) 3.00
  - (b) 3.25
  - (c) 3.75
  - (d) 4.00
8. To draw a pair of tangents to a circle which are inclined to each other at an angle of  $30^\circ$ , it is required to draw tangents at the end points of those two radii of the circle, the angle between them should be
- (a)  $90^\circ$
  - (b)  $120^\circ$
  - (c)  $135^\circ$
  - (d)  $150^\circ$

**SECTION B**

**Question numbers 9 to 14 carry 2 marks each.**

9. For what value of K, given equation has real and equal roots :  
 $(K + 1) x^2 - 2(k - 1) + 1 += 0$
10. The 8<sup>th</sup> term of an Arithmetic Progression (AP) is 37 and its 12<sup>th</sup> term is 57. Find the AP.
11. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm, find the radius of the circle.
12. In the given figure, if TP and TQ are the two tangents to a circle with centre O so that angle POQ = 140°,



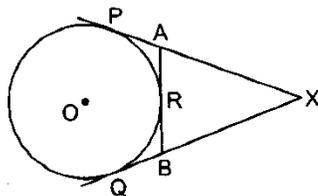
Find angle PTQ.

13. If the perimeter of a semicircular protractor is 36 cm, find the diameter of the protractor. (Take  $\pi = 22/7$ ).
14. The base radii of two right circular cones of the same height are in the ratio 3 : 5. Find the ratio of their volumes

### SECTION C

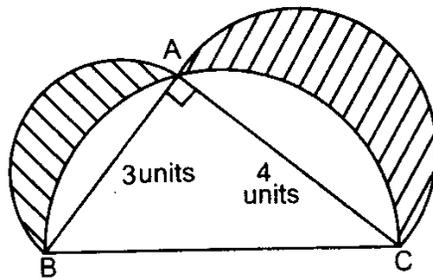
**Question numbers 15 to 24 carry 3 marks each.**

15. Two numbers differ by 3 and their product is 504, find the numbers.
16. Which term of the Arithmetic Progression 3, 10, 17,..... will be 84 more than its 13<sup>th</sup> term?
17. Determine the ratio in which the point (- 6, a) divides the join of A (- 3, - 1) and B (- 8, 9). Also find the value of a.
18. The line joining the points (2, 1) and (5, - 8) is trisected at the points P and Q. If point P lies on the line  $2x - y + k = 0$ , find the value of k.
19. In figure, XP and XQ are two tangents to a circle with centre O from a point X outside the circle. ARB is tangent to circle at R.



Prove that  $XA + AR = XB + BR$ .

20. Draw a circle of radius 3 cm. From a point P, 6 cm away from its centre, construct a pair of tangents to the circle. Measure the lengths of the tangents.
21. From the top of a building 15 m high, the angle of elevation of the top of a tower is found to be  $30^\circ$ . From the bottom of the same building, the angle of elevation of the top of the tower is found to be  $45^\circ$ . Determine the height of the tower and the distance between the tower and the building. ( use  $\sqrt{3} = 1.73$  )
22. In figure, ABC is a right-angled triangle, right-angled at A. Semicircles are drawn on AB, AC and BC as diameters.



Find the area of the shaded region.

23. A hemispherical bowl of internal diameter 30 cm contains some liquid. This liquid is to be filled into cylindrical shaped bottles each of diameter 5 cm and height 6 cm. Find the number of bottles necessary to empty the bowl.
24. A bag contains 4 red, 5 black 6 white balls. A ball is drawn at random from the bag, find the probability that the ball drawn is
  - (a) White
  - (b) Red
  - (c) Not black.

### **SECTION D**

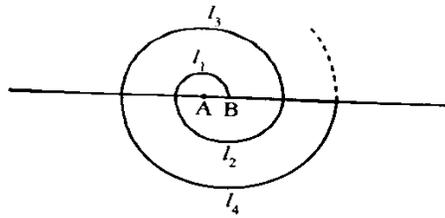
**Question numbers 25 to 34 carry 4 marks each.**

25. In a class test, the sum of the marks obtained by Garvit in Mathematics and Science is 28. Had he got 3 more marks in Maths and 4 marks less in Science, the product of marks obtained in the two subjects would have been 180. Find the marks obtained by Garvit in the two subjects separately.
26. Student of a class 'X' of Our Lady of Fatima collected Rs 9000. They wanted to divide it equally among a certain number of students residing in an orphanage. When they

started distributing the amount, 20 more students from a near by orphanage also joined. Now each student got Rs 160 less.

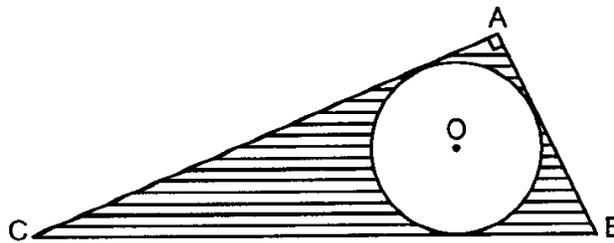
- (a) Find the original number of students living in the orphanage.
- (b) Which value is depicted by students of class 'X' by this activity ?

27. A spiral is made up of successive semicircles, with centres alternately at A and B, starting with centre at A, of radii 0.5 cm, 1.0 cm, 1.5 cm, 2.0 cm.



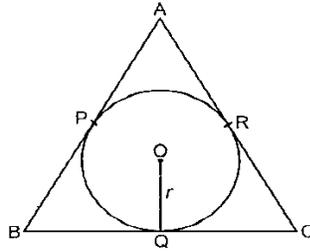
What is the total length of such a spiral made up of fifteen consecutive semi-circles ? (take  $\pi = 22 / 7$ )

28. ABC is a right triangle, right angled at A.



Find the area of shaded region if  $AB = 6$  cm,  $BC = 10$  cm and O is the centre of the in-circle of  $\Delta ABC$ . (Take  $\pi = 3.14$ )

- 29. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in his field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/hr, in how much time will the tank be filled ?
- 30. Find the area of a triangle formed by joining the mid points of the sides of the triangle whose vertices are  $(0, -1)$ ,  $(2, 1)$  and  $(0, 3)$ . Find the ratio of the area of the triangle formed to the area of the given triangle.
- 31. The angle of elevation of a cloud from a point 60 m above a lake is  $30^\circ$  and the angle of depression of the reflection of the cloud in the lake is  $60^\circ$ . Find the height of the cloud from the surface of the lake.
- 32. Solid spheres of diameter 6 cm are dropped into a cylindrical beaker containing some water and are fully submerged. If the diameter of the beaker is 18 cm and water rises by 40 cm, find the number of solid spheres dropped in the water.
- 33. In the figure the sides AB, BC and CA of the triangle ABC touch a circle with centre O and radius r at P, Q and R respectively. Prove that



- (a)  $AB + CQ = AC + BQ$   
 (b)  $\text{Area}(\Delta ABC) = \frac{1}{2} (\text{Perimeter of } \Delta ABC) \times r$
34. 20 cards numbered 1, 2, 3, ..... 20 are put in a box and mixed thoroughly. Shashi draws a card from the box. Find the probability that the number on the card is
- (a) Odd  
 (b) Even  
 (c) A prime  
 (d) Divisible by 3

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