



**ALL INDIA TALENT SEARCH EXAMINATION**

**Maths Talent Search Examination**

Time: 1 hour Class -10 MM.100

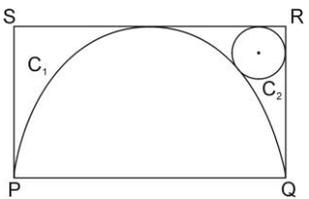
**IMPORTANT INSTRUCTIONS**

- |                                 |  |
|---------------------------------|--|
| 1. Exam duration-1 hour         | 2. 25 MCQs with only one correct answer* |
| 3. All questions are compulsory | 4. Each questions carries 4 marks        |
| 5. No negative marking          |  |

\*This paper contains sample questions and are to be used for reference purpose only.

**GROUP A**

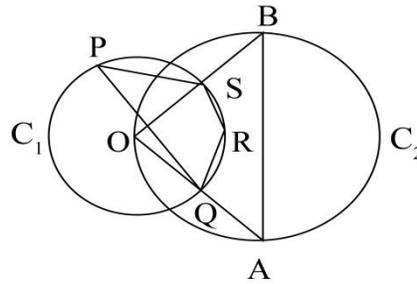
- If  $(x + 1)(x - 2)(x + 3)(x - 4) \dots (x - 100) = a_0 + a_1x + a_2x^2 + \dots + a_{100}x^{100}$ . Then the value of  $a_{99}$  is  
 (a) 1 (b) -1 (c) -50 (d) 50
- The number of quadratic equations which are unchanged by squaring their root is  
 (a) 1 (b) 2 (c) 3 (d) 4
- The sides of a triangle are 5 cm, 7 cm and 10 cm, then the length of the median to the longest side is  
 (a)  $2\sqrt{3}cm$  (b)  $3\sqrt{2}cm$  (c)  $4\sqrt{2}cm$  (d)  $4\sqrt{3}cm$
- PQRS is a rectangle, PQ is diameter of  $C_1$



The ratio of radius of semicircle  $C_1$  and complete circle  $C_2$  is

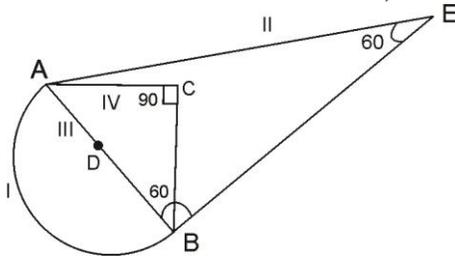
- (a)  $3 - 2\sqrt{2}$  (b)  $3 + 2\sqrt{2}$  (c)  $2 + \sqrt{3}$  (d)  $2 - \sqrt{3}$

5. In the given figure (not to scale), O is the centre of the circle  $C_1$  and AB is the diameter of the circle  $C_2$ . Quadrilateral PQRS is inscribed in the circle with centre O. Find  $\angle QPS$ .

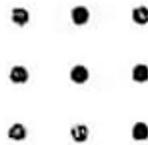


- (a)  $105^\circ$                       (b)  $115^\circ$                       (c)  $135^\circ$                       (d)  $45^\circ$
6. AS shown in figure there are 4 roads from A to B I, II, III, IV. Three roads have stoppage point in the middle of A to B, time for stoppage is 15 min, 20 min & 10 min in IV, III, II respectively and in road I there is no stoppage and also it is semicircular road. Speed is 20 cm/s constant for each road find the way that takes less time compare to other.

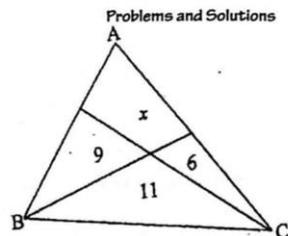
Given that  $AC = CB = 100$  m,  $\angle ACB = 90^\circ$ ,  $\angle AEB = 60^\circ$



- (a) I                      (b) II                      (c) III                      (d) IV
7. Nine dots are arranged such that they are equally spaced horizontally and vertically as in the figure. The number of triangles which are not right angled triangles that can be formed with the above dots as vertices is



- (a) 18                      (b) 21                      (c) 32                      (d) 40
8. Triangle ABC is divided into four regions with areas as shown in the diagram. Find x.

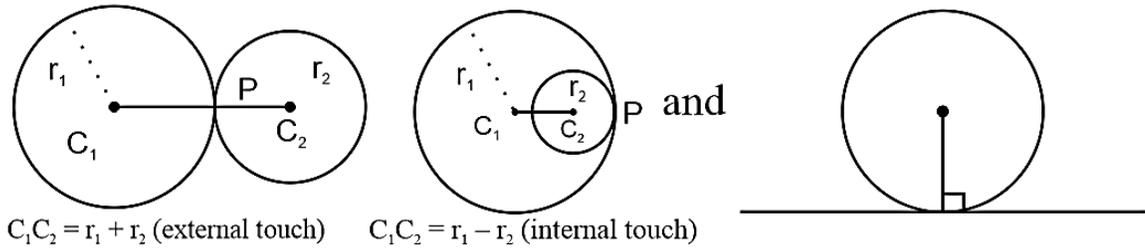


- (a) 1998/67                      (b) 1999/67                      (c) 562/19                      (d) None of these

**GROUP B**

**Directions (9 to 10)**

**If two circles touch each other, then condition will be**



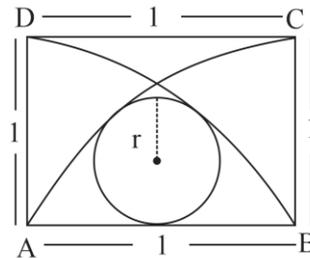
$C_1$  &  $C_2$  are centres of circle :  $r_1$  &  $r_2$  are radius of circle

$C_1C_2$  = distance between centres

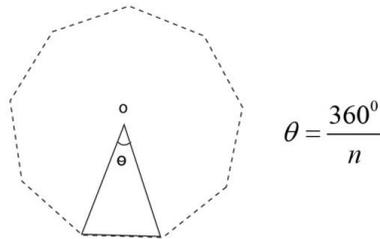
$C_1$ ,  $C_2$  and point of contact  $P$  are collinear

Using above information solve the following

9. ABCD is a square with side 1 unit two quadrant drawn with centres A & B (radius = 1), if  $r$  radius of circle touching both the quadrant and side AB, then  $8r$  is equal to



- (a) 3                      (b) 6                      (c) 9                      (d) 12
10. There are two types of circle bigger circle has radius 3 units and smaller circle has radius 1 unit. Find number of smaller circles which are touching externally with each other and internally with bigger circle given that



$n$  sided regular polygon ( $o$  is centre)

- (a) 3                      (b) 6                      (c) 12                      (d) 18