

## Circles - Class XI

### Related Questions with Solutions

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#### Questions

##### Question: 01

Consider the circles  $s_1 : x^2 + y^2 = 4$  and  $s_2 : x^2 + y^2 - 2x - 4y + 4 = 0$

Which of the following statements are correct?

- A. Number of common tangents to these circles is 2.
- B. If the power of a variable point P w.r.t. these two circles is same then P moves on the line  $x + 2y - 4 = 0$ .
- C. Sum of the y-intercepts of both the circles is 6.
- D. The circles  $S_1$  and  $S_2$  are orthogonal.

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#### Solutions

##### Solution: 01

$s_1 : x^2 + y^2 = 4$  and  $s_2 = x^2 + y^2 - 2x - 4y + 4 = 0$   
centre:  $(0, 0)$ ; radius  $[r_1] = 2$ ;      centre:  $(1, 2)$ ; radius  $[r_2] = 1$

[A]  $d =$  distance between centres  $= \sqrt{5}$

$r_1 + r_2 = 3 \Rightarrow |r_1 - r_2| = 1$

$\therefore |r_1 - r_2| < d < r_1 + r_2$

$\therefore$  these 2 circles are intersecting.

$\therefore$  number of common tangents is 2.  $\Rightarrow$  [A] is correct

[B] Let  $P = (h, k)$

power of point  $P$  is same w.r.t. these two circles.

$\therefore \sqrt{h^2 + k^2} - 2 = \sqrt{h^2 + k^2} - 2h - 4k + 4$

$-4 = -2h - 4k + 4$

$2h + 4k - 8 = 0$

$x + 2y - 4 = 0 \Rightarrow$  [B] is correct

[C] y intercept of  $S_1$  is  $2\sqrt{+4} = 4$

y intercept of  $S_2$  is  $2\sqrt{4} - 4 = 0$

$\therefore$  sum of y-intercept  $= 4 \Rightarrow$  [C] is incorrect

[D]  $2(0 + 0) = -4 + 4 \Rightarrow$  [D] is correct]

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#### Correct Options

Answer:01

Correct Options: A, B, D