Circles - Class XI

Related Questions with Solutions

Questions

Quetion: 01

The area of the circle centred at (–92, 103) and passing through (–95, 99) is
A. 3π
B. 4π
C. 25π
D. 5π

Quetion: 02

A circle passes through (–2, 4) and touches the *y*-axis at (0, 2). Which one of the following equations can represent a diameter of this circle?
A. $2x - 3y + 10 = 0$
B. $3x + 4y - 3 = 0$
C. $4x + 5y - 6 = 0$
D. $5x + 2y + 4 = 0$

Quetion: 03

A circle with centre (3, 6) passes through (–1, 1). Its equation is
A. $x^2 + y^2 - 6x - 12y + 3 = 0$
B. $x^2 + y^2 + 6x - 10y + 3 = 0$
C. $x^2 + y^2 - 3x - 6y + 1 = 0$
D. $x^2 + y^2 - 6x - 12y + 4 = 0$

Quetion: 04

The equation of the circle with centre (2, 2) which passes through (4, 5) is
A. $x^2 + y^2 - 4x + 4y - 77 = 0$

B. $x^2 + y^2 - 4x - 4y - 5 = 0$

C. $x^2 + y^2 + 2x + 2y - 59 = 0$

D. $x^2 + y^2 - 2x - 2y - 23 = 0$

Quetion: 05

Equation of circle with centre $(-a, -b)$ and radius $\sqrt{a^2 - b^2}$ is

A. $x^2 + y^2 + 2ax + 2by + 2b^2 = 0$
B. $x^2 + y^2 - 2ax - 2by - 2b^2 = 0$

C. $x^2 + y^2 - 2ax - 2by + 2b^2 = 0$

D. $x^2 + y^2 - 2ax + 2by + 2a^2 = 0$

Quetion: 06

The radius of the circle $(x\cos\theta + y\sin\theta - a)^2 + (x\sin\theta - y\cos\theta - b)^2 = k^2$ is
A. $a^2 + b^2 - k^2$
B. $a\sin\theta - b\cos\theta$
C. $a^2 + b^2$
D. k

Quetion: 07

If one end of a diameter of the circle $3x^2 + 3y^2 - 9x + 6y + 5 = 0$ is $(1, 2)$, then the other end is
A. (2, 1)

B. (2, 4)
C. (2, – 4)
D. (– 4, 2)

Solutions

Solution: 01

Centre of circle is [–92, 103]. Let its radius be *r*.
$\therefore$ Equation of circle is $(x+92)^2+(y-103)^2=r^2$
Since, it passes through [–95, 99]
$\therefore (-95+92)^2+(99-103)^2=r^2$
$\Rightarrow \quad (-3)^2+(-4)^2=r^2 \Rightarrow r=5$
$\therefore$ Area of circle $=\pi r^2=25\pi$

Solution: 02

Equation of circle with centre (h,k) and touches y-axis is given by
$x^2+y^2-2hx-2ky+k^2=0$
Since, it touches y-axis at $(0,2)$ $\therefore k=2$
$\Rightarrow x^2+y^2-2hx-4y+4=0$
Also, it passes through [–2, 4]
$\therefore \quad (-2)^2+4^2-2h(-2)-4(4)+4=0$
$\Rightarrow 4+16+4h-16+4=0 \Rightarrow h=-2$
Hence, centre of circle is [–2, 2]
[–2, 2] satisfy the equation given in option [a].
So, diameter of circle is 2*x* – 3*y* + 10 = 0.

Solution: 03

We have, Centre = *C*[3, 6]
Let *P*[–1, 1] be any point on the circle. Then, equation of circle is,
$(x-3)^2+(y-6)^2=(3+1)^2+(6-1)^2$
$\Rightarrow x^2+9-6x+y^2+36-12y=16+25$
$\Rightarrow x^2+y^2-6x-12y+4=0$

Solution: 04

Equation of circle passing through $(4,5)$ and having centre $(2,2)$ is,
$(x-2)^2+(y-2)^2=(4-2)^2+(5-2)^2$
$\Rightarrow x^2+y^2-4x-4y-5=0$

Solution: 05

Equation of circle is
$(x+a)^2+(y+b)^2=\left(\sqrt{a^2-b^2}\right)^2$
$\Rightarrow x^2+y^2+2ax+2by+2b^2=0$

Solution: 06

The given equation can be written as
$x^2+y^2+a^2+b^2-2(a\cos\theta+b\sin\theta)x+2(-a\sin\theta+b\cos\theta)y-k^2=0$
Here $g=-a\cos\theta-b\sin\theta, f=-a\sin\theta+b\cos\theta, c=a^2+b^2-k^2$
Radius $=\sqrt{g^2+f^2-c}=\sqrt{a^2+b^2-a^2-b^2+k^2}=\sqrt{k^2}=k$

Solution: 07

Equation of circle is $3x^2+3y^2-9x+6y+5=0$
$\Rightarrow \quad x^2+y^2-3x+2y+\frac{5}{3}=0$
Centre is $\left(\frac{3}{2},-1\right)$ and one end of the diameter is $(1,2)$.

Let the other end of the diameter be [x, y].

$\therefore \frac{x+1}{2} = \frac{3}{2}, \frac{y+2}{2} = -1$

$\Rightarrow \quad x = 2, y = -4$

$\therefore$ Coordinates of the other end of the diameter are $(2, -4)$.

Correct Options

Answer:01
Correct Options: C
Answer:02
Correct Options: A
Answer:03
Correct Options: D
Answer:04
Correct Options: B
Answer:05
Correct Options: A
Answer:06
Correct Options: D
Answer:07
Correct Options: C