UNIT 31 :
Circles

Level 1

[1] The centre of the circle $x^2+y^2+ax+by+c=0$ lies on the x-axis. Which of the following must be true?

A $a=0$

B $b=0$

C $c=0$

D $a^2+b^2-c<0$

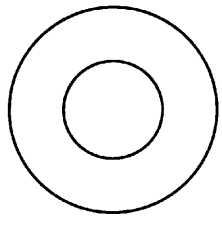
E $b^2-4ac>0$

[2] Find the area of the circle $x^2+y^2-4x+6y-3=0$.

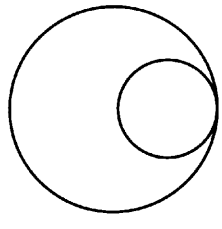
A 4 B 4π C 8π D 16π E 36π

[3] Given the circles $x^2+y^2=1$ and $x^2+y^2-6x+8=0$. Which of the following may represent the relative positions of the two circles?

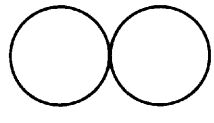
A



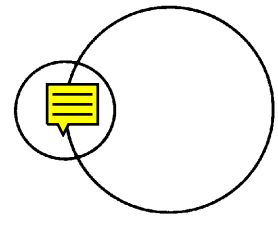
B



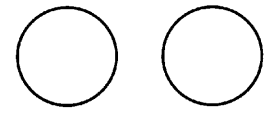
C



D



E



[4] In the figure, the circle touches both axes, $x=4$ and $y=4$ are the tangents in the circles. The equation of the circle is

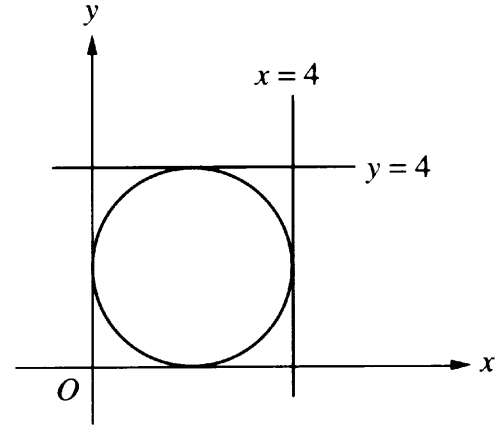
A $x^2+y^2-4x-4y+4=0$

B $x^2+y^2-4x-4y-8=0$

C $x^2+y^2-4x-4y=0$

D $x^2+y^2+4x+4y+4=0$

E $x^2+y^2-2x-2y-4=0$



[5] The figure shows the circle $x^2+y^2-10x-6y+9=0$. $AB=$

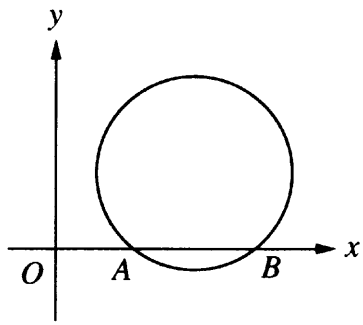
A 1

B 4

C 6

D 8

E 9



[6] The number of points of intersection of the line $x-y+2=0$ and the circle $x^2+y^2-3y+1=0$ is

A 0

B 1

C 2

D 3

E Cannot be determined.

[7] Which of the following is true about the circle $x^2+y^2+4x-8y=0$?

(1) Its centre is $(-4,8)$.

(2) Its radius is $\sqrt{20}$.

(3) It passes through the origin.

A (1) only

B (3) only

C (1) and (2) only

D (2) and (3) only

E (1), (2) and (3)

[8] The figure shows the circle C: $x^2+y^2-6x-2y+9=0$. l is a tangent to C. $\tan\theta=$

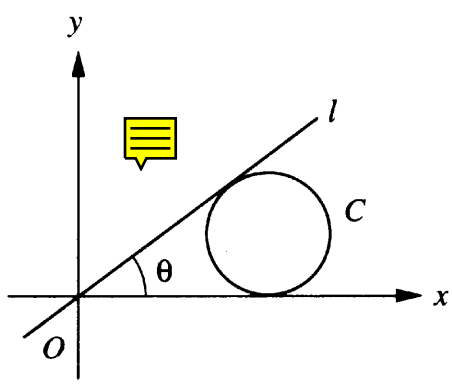
A 0

B $\frac{1}{2}$

C $\frac{3}{4}$

D $\frac{4}{3}$

E $\frac{3}{2}$



Level 2

[9] The line $x+y+k=0$ divides the circle $x^2+y^2+3x+4y=0$ into two equal parts.

$k=$

A $\frac{9}{2}$ B $\frac{7}{2}$ C $\frac{5}{2}$ D $\frac{3}{2}$ E $\frac{1}{2}$

[10] Find the coordinates of the centre of the circle $(2x+1)^2+4y^2=3$.

A $(-1,0)$ B $(-\frac{1}{2},0)$ C $(0,-\frac{1}{2})$ D $(\frac{1}{2},0)$ E $(1,0)$

[11] In the figure, the equation of the circle is

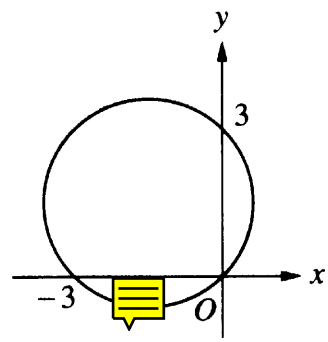
A $x^2+y^2-\frac{3}{2}x-\frac{3}{2}y-9=0$

B $x^2+y^2+3x+3y-18=0$

C $x^2+y^2-3x-3y-18=0$

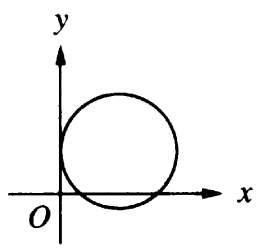
D $x^2+y^2-3x+3y=0$

E $x^2+y^2+3x-3y=0$

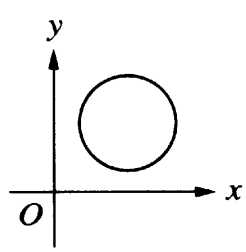


[12] Given the circle $x^2+y^2+2gx+2fy+c=0$. If $fg<0$ and $g^2+f^2-c>0$, which of the following may be the graph of the circle?

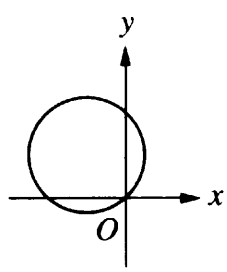
A



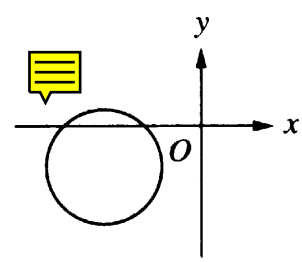
B



C



D



E No such circle exists.

[13] The figure shows the circle $x^2+y^2-2x-4y-4=0$. Find the shaded area.

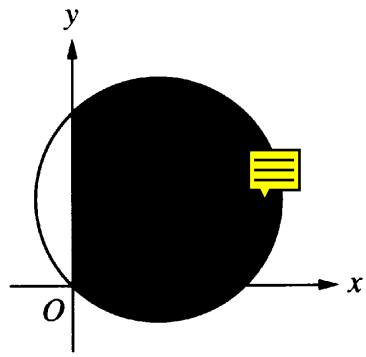
A 20.0

B 17.2

C 16.7

D 16.2

E 13.9



[14] Find the equation of the circle having $A(-1,2)$ and $B(3,4)$ as the end points of a diameter.

A $x^2+y^2-2x-6y+5=0$

B $x^2+y^2-2x-6y-5=0$

C $x^2+y^2+2x+6y+5=0$

D $x^2+y^2-x-3y-10=0$

E $x^2+y^2+x+3y-10=0$

[15] The line $y=mx+c$ is a tangent to the circle $x^2+y^2=1$. Which of the following must be true?

A $m^2+c^2=1$

B $m^2=c^2+1$

C $m^2=c^2-1$

D $c=m+1$

E $c=m-1$

[16] The line $y=2x$ cuts the circle $x^2+y^2-6x-4y-3=0$ at two points A and B. Find the length of AB.

A $\frac{16}{5}$ B $\frac{16}{\sqrt{5}}$ C $\frac{14}{5}$ D $\frac{14}{\sqrt{5}}$ E $\frac{3}{5}$

[17] Find the equation(s) of the tangent(s) from the origin to the circle $x^2+y^2-2x-6y+9=0$.

A $y=\frac{4}{3}x$

B $y=\frac{3}{4}x$

C $y=\frac{4}{3}x,\ x=0$

D $y=\frac{4}{3}x,\ y=0$

E $y=\frac{3}{4}x,\ x=0$

[18] Which of the following must be true about the circles $C_1: x^2+y^2=4$ and $C_2: x^2+y^2+6x+8y+16=0$?

A They are concentric.

B They are of the same size.

C They touch each other.

D They intersect at two points.

E They do not intersect.

[19] The line $y = mx$ intersects the circle $x^2 + y^2 - 2x - 2y - 7 = 0$ at two points A and B. Find the range of values of m.

A $m < \frac{1}{4}$

B $m > \frac{1}{4}$

C $m > -\frac{1}{8}$

D No such values of m exist.

E All values of m.

[20] Given the circle $x^2 + y^2 - 8x - 6y + 21 = 0$. Find the ratio in which the line segment joining the origin and the centre of the circle is divided by the circle.

A 1 : 4 B 1 : 1 C 2 : 5 D 3 : 2 E 3 : 5