8.circle

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6) The lines $2x - 3y = 5$ and $3x - 4y = 7$ are diameters of a circle having area as 154 sq.units.Then the equation of the circle is **(2003)**
   (a) $x^2 + y^2 - 2x + 2y = 62$
   (b) $x^2 + y^2 + 2x - 2y = 62$
   (c) $x^2 + y^2 + 2x - 2y = 47$
   (d) $x^2 + y^2 - 2x + 2y = 47$
7) If a circle passes through the point (a, b) and cuts the circle $x^2 + y^2 = 4$ orthogonally, then the locus of its centre is **(2004)**
   (a) $2ax - 2by - \left(a^2 + b^2 + 4\right) = 0$
   (b) $2ax + 2by - \left(a^2 + b^2 + 4\right) = 0$
   (c) $2ax - 2by + \left(a^2 + b^2 + 4\right) = 0$
   (d) $2ax + 2by + \left(a^2 + b^2 + 4\right) = 4$
8) A variable circle passes through the fixed point $\mathbf{A}(p, q)$ and touches x-axis.The locus of the other end of the diameter through $A$is **(2004)**
   (a) $(y - q)^2 = 4px$
   (b) $(x - q)^2 = 4py$
   (c) $(y - p)^2 = 4qx$
   (d) $(x - p)^2 = 4qy$
9) If the lines $2x + 3y + 1 = 0$ and $3x - y - 4 = 0$ lie along diameter of a circle of circumference 10π, then the equation of the circle is **(2004)**
   (a) $x^2 + y^2 + 2x - 2y - 23 = 0$
   (b) $x^2 + y^2 - 2x - 2y - 23 = 0$
   (c) $x^2 + y^2 + 2x + 2y - 23 = 0$
   (d) $x^2 + y^2 - 2x + 2y - 23 = 0$
10) Intercept on the line $y = x$ by the circle $x^2 + y^2 - 2x = 0$ is $\mathbf{AB}$.Equation of the circle on $\mathbf{AB}$ as a diameter is **(2004)**
   (a) $x^2 + y^2 + x - y = 0$
   (b) $x^2 + y^2 - x + y = 0$
   (c) $x^2 + y^2 + x + y = 0$
   (d) $x^2 + y^2 - x - y = 0$
11) If the circles $x^2 + y^2 + 2ax + cy + a = 0$ and $x^2 + y^2 - 3ax + dy - 1 = 0$ intersect in two distinct points $\mathbf{P}$ and $\mathbf{Q}$ then the line $5x + by - a = 0$ passes through $\mathbf{P}$ and $\mathbf{Q}$ for **(2005)**
   (a) exactly one value of a
   (b) no value of a
   (c) infinitely many values of a
   (d) exactly two values of a
12) A circle touches the x-axis and also touches the circle with centre at $(0, 3)$ and radius 2. The locus of the centre of the circle is **(2005)**
   (a) an ellipse
   (b) a circle
   (c) a hyperbola
   (d) a parabola
13) If a circle passes through the point (a, b) and cuts the circle $x^2 + y^2 = p^2$ orthogonolly, then the equation of the locus of its centre is **(2005)**
   (a) $x^2 + y^2 - 3ax - 4by + \left(a^2 + b^2 - p^2\right) = 0$
   (b) $2ax + 2by - \left(a^2 - b^2 + p^2\right) = 0$
   (c) $x^2 + y^2 - 2ax - 3by + \left(a^2 - b^2 - p^2\right) = 0$
   (d) $2ax + 2by - \left(a^2 + b^2 + p^2\right) = 0$
14) If the pair of lines $ax^2 + 2(a + b)xy + by^2 = 0$ lie along diameters of a circle and divide the circle into four sectors such that the area of one of the sectors is thrice the area of another sector then **(2005)**
   (a) $3a^2 - 10ab + 3b^2 = 0$
   (b) $3a^2 - 2ab + 3b^2 = 0$
   (c) $3a^2 + 10ab + 3b^2 = 0$
   (d) $3a^2 + 2ab + 3b^2 = 0$
15) If the lines $3x - 4y - 7 = 0$ and $2x - 3y - 5 = 0$ are two diameters of a circle of area 49π square units, the equation of the circle is **(2006)**
   (a) $x^2 + y^2 + 2x - 2y - 47 = 0$
   (b) $x^2 + y^2 + 2x - 2y - 62 = 0$
   (c) $x^2 + y^2 - 2x + 2y - 62 = 0$

(d) $x^2 + y^2 - 2x + 2y - 47 = 0$

16) Let **C** be the circle with centre $(0, 0)$ and radius 3 units.The equation of the locus of the mid points of the chords of the circle **C** that subtend an angle of $\frac{2\pi}{3}$ at its centre is

(2006)

(a) $x^2 + y^2 = \frac{3}{2}$
(b) $x^2 + y^2 = 1$
(c) $x^2 + y^2 = \frac{27}{4}$
(d) $x^2 + y^2 = \frac{9}{4}$

17) Consider a family of circles which are passing through the point $(-1, 1)$, and are tangent to x-axis.If (h, k) are the coordinate of the centre of the circles, then the set of values of k is given by the interval

(2007)

(a) $\frac{-1}{2} \leq k \leq \frac{1}{2}$
(b) $k \leq \frac{1}{2}$
(c) $o \leq k \leq \frac{1}{2}$
(d) $k \geq \frac{1}{2}$

18) The point diametrically opposite to the point $\mathbf{P}(1, 0)$ on the circle $x^2 + y^2 + 2x + 2y - 3 = 0$ is

(2008)

(a) $(3, -4)$
(b) $(-3, 4)$
(c) $(-3, -4)$
(d) $(3, 4)$

19) The differential equation of the family of circles with fixed radius 5 units and centre on the line $y = 2$ is

(a) $(x - 2)\, y'^2 = 25 - (y - 2)^2$
(b) $(y - 2)\, y'^2 = 25 - (y - 2)^2$
(c) $(y - 2)^2\, y'^2 = 25 - (y - 2)^2$
(d) $(x - 2)^2\, y'^2 = 25 - (y - 2)^2$

20) If **P** and **Q** are the points of intersection of the circles $x^2 + y^2 + 3x + 7y + 2p - 5 = 0$ and $x^2 + y^2 + 2x + 2y - p^2 = 0$ then there is a circle passing through **P**,**Q** and $(1, 1)$ for:

(2009)

(a) all except one value of p
(b) all except two values of p
(c) exactly one value of p
(d) all value of p