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) $2ax - 2by - (a^2 + b^2 + 4) = 0$
   b) $2ax + 2by - (a^2 + b^2 + 4) = 0$
   c) $2ax - 2by + (a^2 + b^2 + 4) = 0$
   d) $2ax + 2by + (a^2 + b^2 + 4) = 4$

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 $\mathbf{A}$ 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 $x^2 + y^2 = p^2$ orthogonally, then the equation of the locus of its centre is (2005)
   a) $x^2 + y^2 - 3ax - 4by + (a^2 + b^2 - p^2) = 0$
   b) $2ax + 2by - (a^2 - b^2 + p^2) = 0$
   c) $x^2 + y^2 - 2ax - 3by + (a^2 - b^2 - p^2) = 0$
   d) $2ax + 2by - (a^2 + b^2 + p^2) = 0$

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 $\mathbf{C}$ 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 $\mathbf{C}$ 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) $\frac{-1}{2} \le k \le \frac{1}{2}$ c) $o \le k \le \frac{1}{2}$

b) $k \le \frac{1}{2}$ d) $k \ge \frac{1}{2}$

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) $(3, -4)$ c) $(-3, -4)$

b) $(-3, 4)$ 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 $\mathbf{P}$ and $\mathbf{Q}$ 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 $\mathbf{P}, \mathbf{Q}$ 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