MATHS

BOOKS - VGS PUBLICATION-BRILLIANT

MODEL PAPER 6

Section A

1. Find the equation of circle with centre

$(1, 4)$ and radius '5'

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2. Find the value of k if the points (1, 3) and (2, k) are conjugated with respect to the circle $x^2 + y^2 = 35$.

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3. Find the equation of the radical axis of the circles represented by $2x^2 + 2y^2 + 3x + 6y - 5 = 0$ and $3x^2 + 3y^2 - 7x + 8y - 11 = 0$

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4. Find the co-ordinates of the point on the parabola $y^2 = 8x$ whose focal distance is 10.

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5. If the eccentricity of a hyperbola is $\frac{5}{4}$, then find the eccentricity of its conjugate-hyperbola.

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6. Evaluate the integerals.

$$\int e^x \sin e^x \, dx \, on \, R.$$

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7. Evaluate the integerals.

$$\int e^x (\sin x + \cos x) \, dx \, on \, R.$$

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8. Evaluate the definite integrals .

$$\int_0^3 \frac{2x}{1+x^2} dx$$

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9. $\int_0^{\pi/2} \sin^7 x dx$

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10. Find the general solution of $\frac{dy}{dx} = \frac{2y}{x}$.

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Section B

1. Find the pole of $x + y + 2 = 0$ with respect to the circle

$x^2 + y^2 - 4x + 6y - 12 = 0.$

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2. Find the equation and length of the common chord of the following circles.

$x^2 + y^2 + 2x + 2y + 1 = 0,$

$x^2 + y^2 + 4x + 3y + 2 = 0.$

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3. The eccentricity of the ellipse $9x^2 + 16y^2 = 144$ is

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4. Show that the locus of the feet of the perpendiculars drawn from the foci to any tangent of the ellipse is the auxiliary circle

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5. The equations of the tangents to the hyperbola $3x^2 - 4y^2 = 12$ which make equal intercepts on the axes is

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6. Find the equation of the tangents to the hyperbola $3x^2 - 4y^2 = 12$ which are Perpendicular to the line $y = x - 7$

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7. Evaluate the integrals .

$$\int_0^{\pi/2} \frac{\sin^5 x}{\sin^5 x + \cos^5 x} dx$$

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8. Solve the following differential equations.

$$\frac{dy}{dx} + y \tan x = \cos^3 x$$

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Section C

1. If (2,0),(0,1),(4,5) and (0,c) are concyclic, then find c.

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2. Show that the circles

$x^2 + y^2 - 4x - 6y - 12 = 0$ and

$x^2 + y^2 + 6x + 18y + 26 = 0$ touch each other. Also find the point of contact and common tangent at this point of contact.

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3. The equation of the normal to the curve $y^2 = 4ax$ at $\left(at^2, 2at\right)$ is

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4. Evaluate $\int \frac{x+1}{x^2+3x+12} dx.$

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5. Obtain reduction formula for $I_n = \int \sin^n x dx$ for an integer $n \geq 2$ and deduce the value of $\int \sin^4 x dx.$

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6. Evaluate the following integrals

$$\int_0^{\frac{\pi}{4}} \frac{\sin x + \cos x}{9 + 16 \sin 2x} dx$$

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7. Solve $\left(x^2 + y^2\right) dx = 2xy dy$

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