



MATHS

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

QUESTION PAPER -2019

Very Short Answer Type Questions

1. Write the parametric equations of the circle

$$2x^2 + 2y^2 = 7.$$



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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 radical axis of the circles $x^2 + y^2 + 4x + 6y - 7 = 0$, $4(x^2 + y^2) + 8x + 12y - 9 = 0$.

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4. Find the equation of the normal to the parabola $y^2 = 4x$ which is parallel to $y - 2x + 5 = 0$.

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

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6. Evaluate : $\int \frac{1 + \cos^2 x}{1 - \cos 2x} dx$, on $\subset \mathbb{R} / \{n\pi : n \in \mathbb{Z}\}$

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7. Evaluate : $\int \frac{1}{x \log x [\log(\log x)]} dx$, on $(1, \infty)$.

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8. Evaluate : $\int_0^a (\sqrt{a} - \sqrt{x})^2 dx$.

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9. Find the value of the integral

$$\int_0^{\pi/2} \cos^{11} x dx$$

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

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Short Answer Type Questions

1. Find the equation of the circle which cuts orthogonally the circle $x^2 + y^2 - 4x + 2y - 7 = 0$ and having the centre at $(2, 3)$.

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2. The line $y = mx + c$ and the circle $x^2 + y^2 = a^2$ intersect at A and B. If $AB = 2\lambda$, then show that :
$$c^2 = (1 + m^2)(a^2 - \lambda^2).$$

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3. find the equation of the ellipse with focus at $(1, -1)$,
 $e = \frac{2}{3}$ and directrix as $x + y + 2 = 0$.

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4. Find the equations of tangents to the ellipse
 $2x^2 + 3y^2 = 11$ at the points whose ordinate is 1.

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5. Find the foci, eccentricity, equations of the directrix,
length of latus rectum of the hyperbola $x^2 - 4y^2 = 4$.

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6. Find $\int_0^{2\pi} \sin^4 x \cos^6 x dx$

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7. Solve the differential equation :

$$\cos x \cdot \frac{dy}{dx} + y \sin x = \sec^2 x.$$

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Long Answer Type Questions

1. Show that the points (9, 1), (7, 9), (-2, 12), (6, 10) are concyclic and find the equation of the circle on which they

lie.



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2. Show that the four common tangents can

be drawn for the circles given by

$$x^2 + y^2 - 14x + 6y + 33 = 0 \quad \text{---(1)}$$

$$\text{and } x^2 + y^2 + 30x - 2y + 1 = 0 \quad \text{---(2)}$$

and find the internal and external centres

of similitude.



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3. From an external point P tangents are drawn to the

parabola $y(2) = 4ax$ and these tangents make angles

θ_1, θ_2 with $\tan(\theta_1 + \theta_2) = a$ is a constant 'a' show that P lies on a horizontal line.

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4. Evaluate: $\int e^{ax} \sin(bx + c) dx$, ($a, b, c \in \mathbb{R}, b \neq 0$) on \mathbb{R} .

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5. Obtain reduction formula for $I_n = \int \cot^n x dx$, n being a positive integer, $n \geq 2$ and deduce the value of $\int \cot^4 x dx$.

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6. $\int_0^{\pi} x \sin^7 x \cos^6 x dx$

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7. Solve the differential equation : $\frac{dy}{dx} = \frac{2y + x + 1}{2x + 4y + 3}$

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