Q.No.3B (2069) Supp.

If $x = a + b$, $y = a\omega + b\omega^2$ and $z = aw\omega^2 + b\omega$, show that:
$x + y + z = 0$

Q.No.14 (2069) Set 'B'

State De'Moivre's theorem for any positive index n. Using De'Moivre's theorem find the square roots of $4 + 4\sqrt{3}\,i$.

Q.No.3B (2069) Set 'B'

Express $\sqrt{3} + i$ in polar form.

Q.No.14. Or (2069) Set 'A'

Define complex number. Express a complex number into polar form. State De-Moivre's theorem. Using De-Moivre's theorem, find the cube roots of unity.

Q.No.14 (2069) Set 'A'

If $z_1 = r_1(\cos\theta_1 + i\sin\theta_1)$ and $z_2 = r_2(\cos\theta_2 + i\sin\theta_2)$, prove that:

$z_1 z_2 = r_1 r_2\{\cos(\theta_1 + \theta_2) + i\sin(\theta_1 + \theta_2)\}$ and

$\frac{z_1}{z_2} = \frac{r_1}{r_2}\{\cos(\theta_1 - \theta_2) + i\sin(\theta_1 - \theta_2)\}$

Q.No.3B (2069) Set 'A'

If w be a complex cube root of unity, find the value of: $(1 - w + w^2)^4(1 + w - w^2)^4$

Q.No.14 (2068)

State De-Moivre's theorem. Using De-Moivre's theorem, find the square roots of:
$-2 - 2\sqrt{3}\,i$.

Q.No.3B (2068)

Find the cube roots of unity.

Q.No.11A (2067)

Find the square root of : $\frac{5 + 12i}{3 - 4i}$

Q.No.4A (2067)

Express the complex number $\frac{i}{1-i}$ in the polar form.

Q.No.11A (2066)

If $\sqrt{x + iy} = a + ib$, prove that $\sqrt{x - iy} = a - ib$.

Q.No.4A (2066)

Prove that: $(2 + \omega)(2 + \omega^2)(2 - \omega^2)(2 - \omega^4) = 21$

Q.No.11A (2065)

Find the square roots of $(-7 + 24i)$.

Q.No.4A (2065)

If α, β are the complex cube roots of unity then show that :

$\alpha^4 + \beta^4 + \frac{1}{\alpha\beta} = 0$

Q.No.12A (2064)

Solve : $z^6 = 1$.

Q.No.3B (2064)

If 1, w, w^2 be the cube roots of unity, prove that $(1 + w^2)^3 - (1 + w)^3 = 0$

Q.No.12B (2063)

Find the cube roots of unity and discuss their properties.

Q.No.3B (2063)

Find the square roots of $7 + 24i$.

Q.No.11A (2062)

Find the cube roots of unity. Write their properties.

Q.No.4A (2062)

Simplify: $[3(\cos\frac{\pi}{4} + i\sin\frac{\pi}{4})]^{16}$

Q.No.11A (2061)

State De-Moivre's theorem hence solve $z^6 = 1$.

Q.No.4A (2061)

Find he conjugate of the complex number: $\frac{3+4i}{3-4i}$

Q.No.11A (2060)

Using De-Moiver's theorem, find the fourth roots of unity.

Q.No.4A (2060)

Express the complex number, $-\sqrt{2} + i\sqrt{2}$ in polar form.

Q.No.11A (2059)

Find the square roots of $z = 7 - 24i$.

Q.No.4A (2059)

Express in the polar form for $z = 2 + 2i$.

Q.No.11A (2058)

State De-Moivres theorem. Use it to find the cube roots of 1.

Q.No.4A (2058)

Express the complex number $(2, 2\sqrt{3})$ in the polar form.

Q.No.11B (2057)

State De-Moivres Theorem. Use it to find the values of $(1+i)^{20}$

Q.No.4B (2057)

If $Z_1 = (3, 2)$; $Z_2 = (5, 3)$, compute $Z_1 Z_2$ and $\overline{Z_1 + Z_2}$

Q.No.11A (2056)

State De-Moivre's theorem. Use it to find the cube roots of unity.

Q.No.4A (2056)

If $z = 3 + 4i$ and $w = 2 + i$, find $|zw|$ and |Error! Bookmark not defined.|.

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9 | Polynomial Equations

Q.No.8B (2070) 'D'

If one root of the equation $ax^2 + bx + c = 0$ be the square of the other, prove that:
$b^3 + a^2c + ac^2 = 3abc$.

Q.No.3C (2070) 'D'

Find the quadratic equation whose one root is $2 + \sqrt{3}$.

Q.No.8B (2070) 'C'

Find the condition under which the two quadratic equations $ax^2 + bx + c = 0$ and $a^1x^2 + b^1x = c^1 = 0$ may have one root common.

Q.No.3C (2070) 'C'

If the equation $x^2 + 2(k + 2)x + 9k = 0$ has equal roots, find k.

Q.No.8B (2069) Supp.

If the equation $x^2 + px + q = 0$ and $x^2 + qx + p = 0$ have a common root, prove that: $p = q$ or $p + q + 1 = 0$.

Q.No.3C (2069) Supp.

Find the value of k so that the equation $3x^2 + 7x + 6 - k = 0$ has one root equal to zero.

Q.No.8b (2069) Set 'D'

From the equation whose roots are the reciprocals of the roots of: $ax^2 + bx + c = 0$.

Q.No.3c (2069) Set 'B'

If one root of the equation $ax^2 + bx + c = 0$ be twice the other show that: $2b^2 = 9ac$.

Q.No.8b (2069) Set 'A'

Prove that a quadratic equation cannot have more than two roots.

Q.No.3c (2069) Set 'A'

For what values of p will the equation $5x^2 - px + 45 = 0$ have equal roots.

Q.No.3c (2068)

Form a quadratic equation whose roots are -5 and 4.

Q.No.8b (2068)

If the roots of the equation $(a^2 + b^2) x^2 - 2(ac + bd) x + (c^2 + d^2) = 0$ are equal, then show that : $\frac{a}{b} = \frac{c}{d}$.

Q.No.11b (2067) - 4 marks

If one root of the equation $ax^2 + bx + c = 0$ is triple of the other, show that:
$3b^2 = 16ac$.

Q.No.4b (2067) - 2 marks

For what value of k the polynomial $2x^3 - 3x^2 - kx + 4$ divided by $x - 2$ gives remainder 2k?

Q.No.11b (2066)

If one root of the equation $ax^2 + bx + c = 0$ be the square of the other,
prove that : $b^3 + a^2c + ac^2 = 3abc$.

Q.No.4b (2066)

Find the remainder when $x^3 + 6x^2 - x - 30$ is divided by $x+1$.

Q.No.11b (2065)

Find the equation whose roots are reciprocal to the roots of $x^2 - x + 1 = 0$

Q.No.4b (2065)

For what value of k, $x + 3$ is a factor of $3x^2+kx + 6$?

Q.No.11b (2064)

Under what conditions are the roots of the quadratic equation $ax^2 + bx + c = 0$.

i. real and unequal ii. imaginary

Q.No.4c (2064)

Find out which of the following are factors of : $2x^3 - 3x^2 -9x + 10$:

i. $x -1$ ii. $x + 1$ iii. $x - 2$ iv. $x + 2$

Q.No.11b (2063)

Under what conditions will quadratic equation $ax^2 + bx + c = 0$ has,

i. one root the reciprocal of the other.

ii. roots equal in magnitude but opposite in sign.

Q.No.4c (2063)

When $2x^3 + 3x^2 - Kx + 4$ divided by $x - 2$, the remainder is 2K, find the value of K.

Q.No.11b (2062)

The quadratic equation: $ax^2 + bx + c = 0$ cannot have more than two roots. Prove it.

Q.No.4b (2062)

State the factor theorem & test whether $x+ 1$ is the factor of $2x^3 - 4x^2 + 5x - 1$ or not?

Q.No.11b (2061)

It one root of the equation $\ell x^2 + mx + n = 0$ be four times the other,
Show that $4m^2 = 25 \ell n$.

Q.No. 4B (2061)

Apply remainder theorem to find the remainder when, $x^3 - 2x^2 + 5x - 10$ is divided by $x + 2$

Q.No.11B (2060)

If the roots of $\ell x^2 + mx + n = 0$ be in the ratio 3 : 4, show that $12m^2 = 49\,\ell n$.

Q.No.4B (2060)

If the roots of the quadratic equation are $p + q$ and $p - q$, find the quadratic equation.

Q.No.11B (2059)

Show that the roots of the equation $(a^2 - bc)\,x^2 + 2\,(b^2 - ca)\,x + (c^2 - ab) = 0$ will be equal, if either $b = 0$ or $a^3 + b^3 + c^3 - 3abc = 0$.

Q.No.4B (2059)

Is $(x - 2)$ a factor of $x^3 + 3x^2 - 5x + 2$? If not, find the remainder.

Q.No.11B (2058)

If one root of the equation $ax^2 + bx + c = 0$ be the square of the other, prove that, $b^3 + a^3c + ac^2 = 3abc$

Q.No.4B (2058)

Is $(x - 2)$ a factor of $x^3 + 3x^2 - 5x + 2$? Justify your answer.

Q.No.11A (2057)

Find the condition for two given quadratic equations $a_1x^2 + b_1x + c_1 = 0$ and $a_2x^2 + b_2x + C_2 = 0$ may have one root common and both roots common.

Q.No.4A (2057)

Form the quadratic equation whose one root is $3 + 4i$.

Q.No.11B (2056)

If the roots of the equation $lx^2 + nx + n = 0$ be in the ratio p:q, find the value of $\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}}$

Q.No.4B (2056)

For what value of p will the equation $5x^2 - px + 45 = 0$ have equal roots?

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10 | Co-ordinate Geometry

Q.No.13. OR (2070) 'D'

Find the condition under which the equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ may represent a pair of lines.

Q.No.13. (2070) 'D'

Find the equations of the bisectors of the angles between the lines $4x - 3y + 1 = 0$ and $12x - 5y + 7 = 0$ and prove that: the bisectors are at right angles to each other.

Q.No.4A (2070) 'D'

Find the equation of the line passing through the middle point of the line segment connecting (2, -4) and (2, 4) and parallel to the line $3x - 2y = 4$.

Q.No.13. OR (2070) 'C'

Find the equation to the pair of lines joining the origin o\to the inter section of the straight line $y = mx + c$ and the curve $x^2 + y^2 = a^2$. Prove that they are at right angles if $2c^2 = a^2\,(1 + m^2)$.

Q.No.13 (2070) 'C'

Find the length of the perpendicular down from the point (x^1, y^1) on the line whose equation is $Ax + Bx + c = 0$.

Q.No.4A (2070) 'C'

Find the distance between the two parallel lines.

$3x + 5y = 11$ and $3x + 5y = -23$.

Q.No.13. Or (2069) Supp.

Find the angle between the two lines represented by $ax^2 + 2hxy + by^2 = 0$. Find the condition under which the lines will be,

a) Perpendicular to each other

b) Coincident

What condition is to be satisfied for two lines to be real and distinct?

Q.No.13 (2069) Supp.

Find the equation of the lines through the point (3, 2) and making angel 45° with the line $x - 2y = 3$.

Q.No. 4 A (2069) Supp.

If P is the length of the perpendicular dropped from the origin of the line $\frac{x}{a} + \frac{y}{b} = 1$, Prove that: $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2}$.

Q.No.13. Or (2069) Set 'B'

Prove that the bisectors of the angles between the pair of straight lines:

$ax^2 - 2hxy + by^2 = 0$ is given by $\frac{x^2 - y^2}{xy} = \frac{a - b}{h}$

Q.No.13 (2069) Set 'B'

Prove that the perpendicular from the origin upon the straight line joining the points $(c \cos \alpha, c \sin \alpha)$ and $(c \cos \beta, c \sin \beta)$ bisects the distance between them.

Q.No.4A (2069) Set 'B'

Find the equation to the straight line that has y-intercepts 3 and is parallel to the straight line $8x - 4y + 9 = 0$.

Q.No.13. Or (2069) Set 'A'

Show that the homogeneous equation of degree two always represents a pair of straight line passing through the origin. Also, find the angle between them.

Q.No.13 (2069) Set 'A'

If p and P^1 be the lengths of the perpendiculars from origin upon the straight lines whose equations are $x \sec \theta + y \operatorname{cosec} \theta = a$ and $x\cos\theta - y\sin\theta = a \cos^2\theta$.

prove that : $4p^2 + p^{1^2} = a^2$.

Q.No.4A (2069) Set 'A'

Find the equation of a line through (5,4) and perpendicular to the line : $4x - 3y = 10$.

Q.No.13. Or (2068)

Prove that the straight lines joining the origin to the point of intersection of the line $\frac{x}{a} + \frac{y}{b} = 1$ and the curve $x^2 + y^2 = c^2$ are at right angles if : $\frac{1}{a^2} + \frac{1}{b^2} = \frac{2}{c^2}$

Q.No.13 (2068)

Find the angle between two straight lines whose equations are $y = m_1 x + c_1$ and $y = m_2 x + c_2$.

Also find the conditions under which the two straight lines will be

i. parallel   ii. perpendicular

Q.No.4A (2068)

Find the equation of the line parallel to the line $5x + 4y = 9$ and making an intercept -5 on the x-axis.

Q.No.9B (2067) -5 MARKS

Find the condition so that the straight lines joining the origin to the points of intersection of the line $kx + hy = 2hk$ with the circle $(x - h)^2 + (y - k)^2 = c^2$ are at right angle.

Q.No.2c (2067) - 2 Marks

Find the angle between the lines given by $x^2 - 2xy \cot\theta - y^2 = 0$.

Q.No.9b (2066)

Find the equation of the lines which are right angles to the lines represented by: $ax^2 + 2hxy + by^2 = 0$.

Q.No.2c (2066)

For what value of K, the equation $2x^2 + 7xy + 3y^2 - 4x - 7y + K = 0$ represents a line pair?

Q.No.9b (2065)

Show that pair of lines: $x^2 (\tan^2\theta + \cos^2\theta) - 2xy \tan\theta + y^2\sin^2\theta = 0$ make with the axis of x angle such that the difference of their tangent is 2.

Q.No.2c (2065)

Show that the equation $kx^2 + (k^2 - 1) xy - ky^2 = 0$ represents a pair of perpendicular lines for all values of k.

Q.No.9a (2064)

Find the single equation of the lines through the origin and perpendicular to the lines represented by the equation $ax^2 + 2hxy + by^2 = 0$.

Q.No.2c (2064)

Find the equations of the two lines represented by the equation: $2x^2 + 3xy + y^2 + 5x + 2y - 3 = 0$.

Q.No.9b (2063)

Find the equations of the two lines represented by $x^2 + 6xy + 9y^2 + 4x + 12y - 5 = 0$. Prove that the two lines are parallel.

Q.No.2c (2063)

Find the angle between the lines represented by $2x^2 + 7xy + 3y^2 = 0$

Q.No.9b (2062)

Determine the two straight lines represented by $6x^2 - xy - 12y^2 - 8x + 29y - 14 = 0$

Q.No.2c (2062)

Find the value of K so that $2x^2 + 7xy + 3y^2 - 4x - 7y + k = 0$ may represent a pair of lines.

Q.No.9b (2061)

For what values of C, the lines which join the origin to the point of intersection of the line $x - y + c = 0$ and the curve $x^2 + y^2 + 4x - 6y - 36 = 0$ may be at right angle.

Q.No.2c (2061)

Find the angle between the pair of lines $x^2 + 6xy + 9y^2 + 4x + 12y - 5 = 0$.

Q.No.9b (2060)

Show that the lines joining the points of intersection of the line $x + y = 1$ with the curve $4x^2 + 4y^2 + 4x - 2y - 5 = 0$ with the origin are at right angles to each other.

Q.No.2c (2060)

Verify whether the second degree equation: $x^2 + 6xy + 9y^2 + 4x + 12y - 5 = 0$ represents a pair of straight lines or not.

Q.No.9b (2059)

Prove that the straight lines joining the origin to the point of intersection of the line $\frac{x}{a} + \frac{y}{b} = 1$ and the curve $x^2 + y^2 = c$ are at right angles if $\frac{1}{a^2} + \frac{1}{b^2} = \frac{2}{c^2}$.

Q.No.2c (2059)

Find the angle between the line pair $2x^2 + 7xy + 3y^2 = 0$.

Q.No.9b (2058)

Prove that the pair of straight lines joining the origin to the points of intersection of the line $y = mx + c$ and the curve $x^2 + y^2 = a^2$ are at right angles of $2c^2 = a^2 (1 + m^2)$

Q.No.2c (2058)

Find the angle between the line pair given by : $x^2 - 2xy \cot\theta - y^2 = 0$

Q.No.9b (2057)

If the pair of lines $x^2 - 2pxy - y^2 = 0$ and $x^2 - 2qxy - y^2 = 0$ be such that each pair bisects the angles between the other pair, prove $pq = -1$.

Q.No.2c (2057)

Determine the lines represented by the equation $x^2 + 2xy + y^2 - 2x - 2y - 15 = 0$.

Q.No.9b (2056)

Prove that the straight lines joining the origin to the points of intersection of the line $\frac{x}{a}+\frac{y}{b}=1$ and the curve $x^2 + y^2 = c^2$ are at right angles if $\frac{1}{a^2}+\frac{1}{b^2}=\frac{2}{c^2}$

Q.No.2c (2056)

Write the condition for which the equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ may represent a line pair.

Q.No.9a (2067) -4 Marks

Find the equation to the straight line which makes equal intercepts on the axes and passes through the point of intersection of the lines $2x - 3y + 1 = 0$ and $x + 2y - 2 = 0$.

Q.No.2b (2067)- 2 Marks

Find the value of k so that the line whose equation is $x + y = k$ will form a triangle with the coordinate axes whose area is 32 sq. units.

Q.No. 9a (2066)

Determine the value of m for which the straight lines $y = x + 1$, $y = 2(x+1)$ and $y = mx + 3$ are concurrent.

Q.No.2a (2066)

Examine whether the points (0, 11), (2, 3) and (3, -1) are collinear or not.

Q.No.9a (2065)

The origin is a corner of a square and two of its sides are given by $2x + y = 0$ and $2x + y = 3$. Find the equations of the other two sides.

Q.No.2b (2065)

Find the equation of the line through the intersection of the lines $3x - 4y + 1 = 0$ and $5x + y - 1 = 0$, and cutting off equal intercepts from the axes.

Q.No.9b (2064)

Find the equations of the straight lines which passes through the point (2, 3) and are inclined at 45° to the straight line $x + 3y + 4 = 0$.

Q.No.2b (2064)

If p be the perpendicular distance of the origin from a line whose intercepts on the axes are a and b, prove that $\frac{1}{p^2}=\frac{1}{a^2}+\frac{1}{b^2}$

Q.No.9a, Or (2063)

Find the equations of the bisectors of the angles between the straight lines:
$3x - 4y + 3 = 0$ and $12x - 5y - 1 = 0$.

Q.No.9a (2063)

Prove that the equation of the straight line which passes through the point $(a\cos^3\theta, a\sin^3\theta)$ and is perpendicular to the straight line $x \sec\theta + y \operatorname{cosec}\theta = a$ is $x \cos\theta - y \sin\theta = a \cos^2\theta$.

Q.No.2b (2063)

Find the intercepts on the axes made by the line $2x + 3y = 5$.

Q.No.9A (2062)

Find the equation of the locus of a point P which is equidistant from: $3x - 4y + 2 = 0$ and the origin.

Q.No.2B (2062)

Find the distance between the parallel lines, $y = 2x + 4$ and $6x - 3y = 5$.

Q.No.9A (2061)

Find the equation to the straight line which passes through the intersection of the straight lines $3x - 4y + 1 = 0$ and $5x + y = 1$ and cuts off equal intercepts from the axes.

Q.No.2B (2061)

Find the straight lines which have slope -1 and form a triangle of area 8 square units with coordinate axes.

Q.No.9A (2060)

Find the equation of the line through the point that divides the join of the points (-3, -4) and (7, 1) in the ratio 3 : 2 and is perpendicular to the join.

Q.No.2B (2060)

Find the equation of the straight line whose slope is $\frac{1}{3}$ and passes through the intersection of lines $y = x$ and $y = -x$.

Q.No.9A (2059)

Find the length of the perpendicular from the point (x_1, y_1) on a straight line $x \cos \alpha + y \sin \alpha = p$.

Q.No.2B (2059)

Find the equation of the line through (5, 4) and perpendicular to the line $4x - 3y = 10$.

Q.No.9A (2058)

Find the length of the perpendicular from the point (h, k) on a straight line $x \cos\alpha + y \sin\alpha = p$

Q.No.2B (2058)

Write the conditions for which the straight lines given by $A_1x + B_1y + C_1 = 0$ and $A_2x + B_2y + C_2 = 0$ will be parallel and perpendicular.

Q.No.9A (2057)

Find the length of the perpendicular from the point (x_1, y_1) on a straight line

$x \text{ Cos } \alpha + y \text{ Sin } \alpha = p$.

Q.No.2B (2057)

What are the standard forms of equation of a straight line? Find the slope of the line

$\frac{x}{a} - \frac{y}{b} = 1$.

Q.No.9A (2056)

Find the angles between two lines given by $y = m_1x + c_1$ and $y = m_2x + C_2$. Also state the condition for them to be perpendicular and parallel.

Q.No.2B (2056)

Find the acute angle between the lines $x - 3y - 6 = 0$ and $y = 2x + 5$.

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11 | Circle

Q.No.9A (2070)'D'

Find the value of k so that the line $4x + 3y + k = 0$ may touch the circle:

$x^2 + y^2 - 4x + 10y + 4 = 0$.

Q.No.4B (2070) 'D'

Find the centre and the radius of the circle.

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

Q.No.9A (2070) 'C'

Find the equation of the tangent and normal to the circle:
$x^2 + y^2 - 3x + 10y - 5 = 0$ at the point (4, -11)

Q.No.4B (2070) 'C'

Find the equation of the circle whose two of the diameters are $x + y = 6$ and $x + 2y = 8$ and radius 10.

Q.No.9A (2069) Supp.

Find the equation of the tangent and normal to the circle:
$x^2 + y^2 - 2x - 4y + 3 = 0$ at (2, 3)

Q.No.4B (2069) Supp.

Find the equation of the circle with (0, 0) and (4, 7) as the ends of a diameter.

Q.No.9A (2069) Set 'B'

Show that the circles $x^2 + y^2 - 6x - 6y + 10 = 0$ and $x^2 + y^2 = 2$ touch each other at (1, 1).

Q.No.4B (2069) Set 'B'

Find the equation to the circle which has the points (0, -1) and (2, 3) as ends of a diameter.

Q.No.9A (2069) Set 'A'

Find the equation of the tangent to the circle $x^2 + y^2 - 2x - 4y - 4 = 0$ which are perpendicular to $3x - 4y = 1$.

Q.No.4B (2069) Set 'A'

Find the equation of the circle concentric with the circle $x^2 + y^2 - 8x + 12y + 15 = 0$ and passing through (5,4).

Q.No.9A (2068)

Show that the tangents to the circle $x^2 + y^2 = 100$ at the points (6, 8) and (8, -6) are perpendicular to each other.

Q.No.4B (2068)

Find the equation of the circle with center at (4, -1) and passing through the origin.

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12 Limit and Continuity

Q.No.9B, or (2070) 'D'

A function $f(x)$ is defined below:

$$f(x) = \begin{cases} kx + 3 & \text{for } x \geq 2 \\ 3x - 1 & \text{for } x < 2 \end{cases}$$

find the value of k so that f(x) is continuous at x = 2.

Q.No.9B (2070) 'D'

Evaluate : $\lim_{x \to \infty} \sqrt{x}\,(\sqrt{x} - \sqrt{x-a})$

Q.No.4C (2070) 'D'

Evaluate : $\lim_{x \to \frac{\pi}{4}} \frac{\sec^2 x - 2}{\tan x - 1}$

Q.No.9b, Or (2070) 'C'

A function f(x) is defined as follows: $f(x) = \begin{cases} 3+2x \ \ for & -\frac{3}{2} \le x < 0 \\ 3-2x \ \ for & 0 \le x < \frac{3}{2} \\ -3-2x \ \ for & x \ge \frac{3}{2} \end{cases}$

Show the f(x) is continuous at x = 0 but discontinuous at $x = \frac{3}{2}$.

Q.No.9b (2070) 'C'

Evaluate: $\lim_{x \to \theta} \frac{x\cot\theta - \theta\cot x}{x - \theta}$

Q.No.4c (2070) 'C'

Evaluate: $\lim_{x \to 4} \frac{x^3 - 64}{x^2 - 16}$

Q.No.9b, Or (2069) Supp.

Let a function f(x) be defined by : $f(x) = \begin{cases} 2-x^2 & for \ \ x < 2 \\ 3 & for \ \ x = 2 \\ x-4 & for \ \ x > 2 \end{cases}$

Show that the limit of the function $f(x)$ exists as x = 2. Is the function f(x) continuous at x = 2? If not, how would you make it continuous?

Q.No.9b (2069) Supp.

Evaluate: $\lim_{x \to a} \frac{\sqrt{3a - x} - \sqrt{x + a}}{4(x-a)}$

Q.No.4c (2069) Supp.

Evaluate: $\lim_{x \to 0} \frac{1 - \cos 6x}{x^2}$

Q.No.9b, Or (2069) Set 'B'

Show that the function: : $f(x) = \begin{cases} x & when \ \ 0 \le x < \frac{1}{2} \\ 1 & when \ \ x = \frac{1}{2} \\ 1-x & when \ \ \frac{1}{2} < x < 1 \end{cases}$

is discontinuous at $x = \frac{1}{2}$. Also, write how it could be made continuous?

Q.No.9b (2069) Set 'B'

Evaluate: $\lim_{x \to 2} \frac{x - \sqrt{8 - x^2}}{\sqrt{x^2 + 12 - 4}}$

Q.No.4c (2069) Set 'B'

Evaluate: $\lim_{x \to 0} \frac{1 - \cos px}{1 - \cos qx}$

Q.No.9b. Or (2069) Set 'A'

Define continuity of a function at a point. A function is defined as follows:

$$f(x) = \begin{cases} \text{Error! Bookmark not defined.} & for \quad x \neq 3 \\ K & for \quad x = 3 \end{cases}$$

find the value of k so that f(x) is continuous at x = 3.

Q.No.9b (2069) Set 'A'

Evaluate: $\lim\limits_{x \to \theta} \dfrac{x\cos\theta - \theta\cos x}{x - \theta}$

Q.No.4c (2069) Set 'A'

Evaluate: $\lim\limits_{x \to \infty} \sqrt{x} - \sqrt{x - 3}$

Q.No.9b. Or (2068)

A function f (x) is defined as follows:

$$f(x) = \begin{cases} 2x + 1 & for \quad x < 1 \\ 2 & for \quad x = 1 \\ 3x & for \quad x > 1 \end{cases}$$

Is the function continuous at x = 1? If not, can it be made continuous at x = 1?

Q.No.9b (2068)

Evaluate: $\lim\limits_{x \to a} \left(\dfrac{\sqrt{3x} - \sqrt{2x + a}}{2\,(x - a)}\right)$

Q.No.4c (2068)

Evaluate: $\lim\limits_{x \to a} \dfrac{\sin (x - a)}{(x^2 - a^2)}$

Q.No.12b. Or (2067) - 4 marks

Discuss the continuity of the function:

f(x) = x sin 1/x when $x \neq 0$

= 0 when x = 0 ; at x = 0.

Q.No.12b (2067) - 4marks

Evaluate: $\underset{x \to 0}{Lt} \dfrac{(a + x) \sec (a + x) - a \sec a}{x}$

Q.No.6a (2067) - 2 marks

Test the continuity of f (x) = x + 2 when $x \neq 2$,

= 4 when x = 2; at x = 2.

Q.No.5a (2067) - 2 marks

Evaluate: $\underset{x \to \infty}{Lt} \left(x - \sqrt{x^2 + x}\right)$

Q.No.12b. or (2066)

A function is defined as follows: f (x) = -x when x < 0

= x when 0 < x < 1

= 2 -x when $x \geq 1$

Show that It is continuous at x = 0 and x = 1

Q.No.12b (2066)

Evaluate: $\underset{x \to 0}{Lim} \dfrac{x\sin\theta - \theta\sin x}{x - \theta}$

Q.No.6a (2066)

Determine the limit of:

$$\left.\begin{aligned} f(x) &= 2 - x^2 \quad for\ x \leq 2 \\ &= x - 4 \quad for\ x > 2 \end{aligned}\right\} \text{ at } x = 2, \text{ if it exists.}$$

Q.No. 5A (2066)

Evaluate: $\lim_{x\to 0} \frac{\sqrt{1+x^2}-\sqrt{1-x^2}}{x}$

Q.No. 12B .OR (2065)

Test the continuity of the function:

$$f(x) = \begin{cases} x, \text{ when } 0 \le x < \frac{1}{2} \\ 1, \text{ when } x = \frac{1}{2} \\ 1 - x, \text{ when } \frac{1}{2} < x < 1 \end{cases}$$

at $x = \frac{1}{2}$

Q.No.12B (2065)

Evaluate: $\underset{x\to\frac{x}{2}}{Lt} \frac{\tan x + \text{Cot } x}{\tan x - \text{Cot } x}$

Q.No.6A (2065)

Discuss the continuity of the function $\frac{x^2-9}{x-3}$ and point out the discontinuity If exists.

Q.No.5A (2065)

Evaluate: $\lim_{x\to a} \frac{\text{Sin }(x - a)}{x^2 - a^2}$

Q.No.13B, OR (2064)

Show that the function $f(x) = \frac{\text{Sin}^2 ax}{x^2}, \ (x \ne 0)$

$= 1 \quad , \ (x = 0)$

is discontinuous at $x = 0$.

Redefine the function is such a way that it becomes continuous at $x = 0$.

Q.No.13B (2064)

Evaluate : $\lim_{x\to 0} \frac{\tan x - \tan y}{x - y}$

Q.No.6C (2064)

Why the function $f(x) = \text{Sin } \frac{1}{2}$ is not continuous at $x = 0$?

Q.No.5C (2064)

Evaluate: $\lim_{x\to 0} \frac{\text{Sin } x°}{x}$

Q.No.13B, OR (2063)

Evaluate: $\underset{x\to\theta}{Lt} \frac{x\text{Cos}\theta - \theta\text{Cos}x}{x - \theta}$

Q.No.13B (2063)

Let a function $f(x)$ be defined by:

$f(x) = 2 - x^2 \quad (x < 2)$

$= 3 \quad (x = 2)$

$= x - 4 \quad (x > 2)$

Verify that the limit of the function exists at $x = 2$. Is the function continuous at $x = 2$? State how can you make it continuous.

Q.No.6c (2063)

Find the limit of the function for $f(x) = x+2$ when $x \geq 0$ and $f(x) = 4x + 2$ when $x<0$ at $x = 0$.

Q.No.5c (2063)

Show that: $\lim_{x \to 2} \frac{x^2-4}{\sqrt{3x-2}-\sqrt{x+2}} = 8$

Q.No.12b, Or (2062)

A function is defined as:

$$f(x) = \begin{cases} 3x^2+2 & \text{if } x < 1 \\ 2x+3 & \text{if } x \geq 1 \end{cases}$$

Find $\lim_{x \to 1} f(x)$

Q.No.12b (2062)

Prove that: $\lim_{x \to 1} \frac{x-\sqrt{2-x^2}}{2x-\sqrt{2+2x^2}} = 2$

Q.No.6a (2062)

If the function $f(x) = \frac{1}{1-x}$ continuous at $x = 1$?

Q.No.5a (2062)

Evaluate: $\lim_{x \to x} \frac{x^{2/3}-a^{2/3}}{x-a}$

Q.No.12b, Or (2061)

Discuss the continuity of the function:

$$f(x) = \begin{cases} x \sin\frac{1}{2} & \text{where } x \neq 0 \\ 0 & \text{where } x=0 \end{cases}$$

Q.No.12b (2061)

Evaluate: $\lim_{x \to y} \frac{\tan x - \tan y}{x-y}$

Q.No.6a (2061)

Show that the function $f(x) = \begin{cases} x+2 & \text{for } x \neq 2 \\ 0 & \text{for } x = 2, \end{cases}$ is not continuous at $x = 2$

Q.No.5a (2061)

Evaluate: $\lim_{x \to 1} \frac{\sqrt{2x}-\sqrt{3-x^2}}{x-1}$

Q.No.12b Or (2060)

Discuss the continuity of the function: $f(x) = |x|$ at $x = 0$

Q.No.12b (2060)

Evaluate: $\lim_{x \to 1} \frac{\tan x - \sin x}{x^3}$

Q.No.6a (2060)

A function is defined as $f(x) = \begin{matrix} x^2-1 & \text{when } x<1 \\ x^{2+1} & \text{when } X \geq 1 \end{matrix}$

Examine whether the function is continuous or not at $x = 1$.

Q.No.5a (2060)

Does the limit of the function $f(x) = \begin{matrix} x \text{ when } x > 0 \\ -x \text{ when } x < 0 \end{matrix}$ exist at $x = 0$? Justify your answer.

Q.No.12b, Or (2059)

When does a function f(x) become continuous at a given point x = a? Test the continuity of:

$$\left.\begin{aligned} f(x) &= 2x+2 && \text{for } x < 1 \\ &= 2x && \text{for } x = 1 \\ &= 3x && \text{for } x > 1 \end{aligned}\right\} \text{at } x = 1$$

Q.No.12B (2059)

Evaluate: $\lim_{x \to \infty} \sqrt{x}\,(\sqrt{x} - \sqrt{x-a})$

Q.No.6A (2059)

Does the limit of the function, $f(x) \begin{matrix} = 2x+1 & for\ x\ 1 \\ = 4x^2 - 1 & for\ x < 1 \end{matrix} \Big\}$ at x = 1 exist?

Q.No.5A (2059)

Evaluate: $\lim_{x \to 0} \frac{1 - \cos px}{1 - \cos qx}$

Q.No.12B .Or (2058)

Prove geometrically, $\lim_{x \to 0} \frac{\sin x}{x} = 1$

Q.No.12B (2058)

Discuss the continuity of the function:

$$f(x) \begin{matrix} = 2x+1, & for & x < 1 \\ = 2x & for & x = 1 \\ = 3x & for & x > 1 \end{matrix} \Bigg\} \text{ at } x = 1.$$

Q.No.6A (2058)

Is the function $f(x) = \frac{x^2 - 9}{x - 3}$ continuous at x = 3? Justify your answer.

Q.No.5A (2058)

Evaluate: $\lim_{x \to \infty} (\sqrt{x+a} - \sqrt{x})$

Q.No.12B. Or (2057)

When does a function f(x) become continuous at x = a ? Discuss the continuity of:

$$f(x) \begin{matrix} = 2x+1, & for & x < 1 \\ = 2x, & for & x = 1 \\ = 3x, & for & x > 1 \end{matrix} \Bigg\} \text{ at } x = 1.$$

Q.No.12B (2057)

Evaluate: $\lim_{x \to y} \frac{\sin x - \sin y}{x - y}$

Q.No.6A (2057)

Find the limit of the function $f(x) \begin{matrix} = x^2 + 2, & x \le 5 \\ = 3x + 12, & x > 5 \end{matrix} \Big\}$ at x = 5 if it exists.

Q.No.5A (2057)

Evaluate: $\lim_{x \to 1} \frac{x^2 + 3x - 4}{x - 1}$

Q.No.12B. Or (2056)

When does a function f(x) become continuous at x = a ? Is the function f(x) defined by

$$f(x) \begin{matrix} = 3 + 2x & -3/2 \le x < 0 \\ = 3 - 2x & 0 \le x < 3/2 \\ = -3 - 2x & x \ge 3/2 \end{matrix} \Bigg\} \text{ continuous at } x = \frac{3}{2}?$$

Q.No.12B (2056)

Prove geometrically $\lim_{\theta \to 0} \frac{\sin\theta}{\theta} = 1$

Q.No.6A (2056)

Determine the limit of $f(x) = \begin{matrix} 2 - x^2 & for\ x < 2 \\ x - 4 & for\ x > 2 \end{matrix} \Big\}$ at x = 2, if it exists.

Q.No.5A (2056)

Evaluate: $\lim_{x \to \infty} (\sqrt{x} - \sqrt{x-3})$

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13 The Derivatives

Q.No.10a (2070) 'D'

Find from first principles, the derivative of $\sqrt{1+x}$.

Q.No.5a (2070) 'D'

Find $\frac{dy}{dx}$ when $x - y = \tan xy$.

Q.No.10a (2070) 'C'

Find from first principles the derivative of $\sqrt{2-3x}$.

Q.No.5a (2070) 'C'

Find $\frac{dy}{dx}$ when $x = t + \frac{1}{t}$ and $y = 1 - \frac{1}{t}$.

Q.No.10a (2069) Supp.

Find from the principle, the derivative of tan 3x.

Q.No.5a (2069) Supp.

Find $\frac{dy}{dx}$ is $x = 2a \tan\theta$ $y = a \sec^2\theta$.

Q.No.10a (2069) Set 'B'

Find from first principles the derivative of $f(x) = \frac{1}{\sqrt{x+a}}$

Q.No.5a (2069) Set 'B'

Find $\frac{dy}{dx}$ when $y = \frac{1}{\sec x - \tan x}$

Q.No.10a (2069) Set 'A'

Find from first principles the derivative of $\sqrt{2x+3}$.

Q.No.5a (2069) Set 'A'

Find $\frac{dy}{dx}$ if $x^3 + y^3 - 3axy = 0$.

Q.No.10a (2068)

Find from first principle, the derivative of sin4x.

Q.No. 5a (2068)

Find the derivative of 1 $\frac{1}{x-\sqrt{a^2+x^2}}$

Q.No.13a (2067) - 4 marks

Find from definition, the derivative of $\frac{1}{\sqrt{x}}$

Q.No. 5c (2067) -2 marks

Find the derivative of $\tan^{-1}\frac{\sin 2x}{a+\cos 2x}$

Q.No.13a (2066)

Find from first principles the derivatives of sin2x.

Q.No.5c (2066)

Find $\frac{dy}{dx}$ if $ax^2 + 2hxy + by^2 = 1$.

Q.No.13a (2065)

Find from first principles, the derivative of $\sqrt{\text{Sin } 2x}$

Q.No.5c (2065)

Find $\frac{dy}{dx}$, when,

$y = \text{Sin}\theta$ and $\theta = 5x^2 - 6x + 2$.

Q.No.12b. or (2064)

Find from definition the derivative of $\cos^2 x$.

Q.No.5b (2064)

Find $\frac{dy}{dx}$ where $y = \tan^{-1}\left(\frac{2x}{1-x^2}\right)$

Q.No.12a . Or (2063)

Find, from definition, the derivative of $\frac{1}{\sqrt{x+2}}$

Q.No.5b (2063)

Find $\frac{dy}{dx}$ when $y = \sin^{-1}(3x - 4x^3)$

Q.No.13a (2062)

Find from definition, the derivative of $\sqrt{\tan x}$. Show that the rectangle of largest possible area for a given perimeter is a square.

Q.No.5c (2062)

Find $\frac{dy}{dx}$ if $y = \tan^{-1}\frac{2x}{1-x^2}$

Q.No.13a (2061)

Find $\frac{dy}{dx}$ from first principle when $y = x + \sqrt{x}$

Q.No.5c (2061)

Differentiate Sinx with respect to tanx.

Q.No. 13a (2060)

Find $\frac{dy}{dx}$ from first principle $y = \sqrt{\tan x}$

Q.No.5c (2060)

Find $\frac{dy}{dx}$ when $x = 2a \tan$ and $y = a \sec^2\theta$

Q.No.13a (2059)

Find from the first principles the derivative of: $\frac{1}{\sqrt{3x-4}}$

Q.No.5c (2059)

Find $\frac{dy}{dx}$ of $x = a \sin t$, $y = a \cos t$.

Q.No.13a (2058)

Find from definition the derivatives of sin2x.

Q.No.5c (2058)

Find $\frac{dy}{dx}$ of $x = a \sin t$, $y = a \cos t$.

Q.No.13a (2057)

Find, from the first principles the derivative of $y = \sqrt{\sin 2x}$

Q.No.5c (2057)

Find $\frac{dy}{dx}$ of $y = e^{\sin(\log x)}$

Q.No.13a (2056)

Find, from the first principles the derivative' of $y = \frac{1}{\sqrt{ax+b}}$

Q.No.5c (2056)

Find $\frac{dy}{dx}$ of $y = e^{5x} \sin(\log x)$.

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Q.No.15 (2070) 'D'

Write the criteria for the function $y = f(x)$ to have the local maxima and local minima at a point. Find the local maxima and local minima of the function $f(x) = 2x^3 - 9x^2 - 24x + 3$. Also find the point of inflection.

Q.No.5c (2070) 'D'

A stone thrown into a pond produces circular ripples which expands from the point of impact. If the radius of the ripple increases at the rate of 3.5cm/sec, find how fast is the area growing when the radius is 15cm. $\left(\pi = \frac{22}{7}\right)$

Q.No.15. Or (2070) 'C'

A spherical ball of salt is dissolving in water in such a way that the rate of decrease in volume at any instant is proportional to the surface. Prove that the radius is decreasing at the constant rate.

Q.No.15 (2070) 'C'

List the criteria for the function $y = f(x)$ to have the local maxima and local minima at a point. Find the local maxima and local minima of the function $f(x) = 4x^3 - 15x^2 + 12x + 7$. Also, find the point of inflection.

Q.No.5c (2070) 'C'

Find the interval in which the function $f(x) = 3x^2 - 6x + 5$ is increasing or decreasing.

Q.No.15. Or (2069) Supp.

Two concentric circles are expanding in such a way that the radius of the inner circle is increasing at the rate of 10cm/sec and that of the outer circle at the rate of 7cm/sec. At a certain time, the radius of the inner and the outer circle are the respectively 24 cm and 30cm. At what time, is the area between the circles increasing or decreasing? How fast?

Q.No.15 (2069) Supp.

What are the criteria for the graph of the function $y = f(x)$ to have concave upward and concave downward? Determine where the graph is concave upward and where it is concave downward of the function.

$$f(x) = x^4 - 8x^3 + 18x^2 - 24$$

Q.No.5c (2069) Supp.

Test the increasing and decreasing of the function
$f(x) = x^2 - 3x + 4$ at the points $x = 2$ and $x = 1$.

Q.No.15 .Or (2069) Set 'B'

The volume of a spherical balloon is increasing at the rate of 25 cubic cm/sec. Find the rate of change of its surface at the instant when its radius is 5 cm.

Q.No.15 (2069) Set 'B'

Find the maximum and minimum values of the function $f(x) = x^3 - 6x^2 + 9x - 2$. Also, find the point of inflection, if any.

Q.No.5c (2069) Set 'B'

For any curve $y = 1(x)$, what do $f'(x) > 0$ and $f'(x) < 0$ represent?

Q.No.15 (2069) Set 'A'

What are the criteria for a function $y = f(x)$ to have the local maxima and local minima at a point? Find the local maxima and local minima of the function $f(x) = 4x^3 - 6x^2 - 9x + 1$ on the interval (-1, 2), Also find the point of inflection.

Q.No.10b (2069) Set 'A'

Find the area of the region between the curve $y^2 = 16x$ and the line $y = 2x$.

Q.No.5c (2069) Set 'A'

The side of a square sheet is increasing at the rate of 5cm/mm. At what rate is the area increasing when the side is 12 cm. long?

Q.No.15, Or (2068)

A Spherical ball of salt dissolving in water decreases its volume at the rate of $0.75cm^3$ / min. Find the rate at which the radius of the salt is decreasing when its radius is 6cm.

Q.No.15 (2068)

List the criteria for the function $y = f(x)$ to have local maxima and local minima at a point. Find the local maxima and local minima of the function $f(x) = 4x^3 - 15x^2 + 12x + 7$. Also, find the point of inflection.

Q.No.5c (2068)

Examine whether the function $f(x) = 15x^2 - 14x + 1$ is increasing or decreasing at $x = \frac{2}{5}$ and $x = \frac{5}{2}$.

Q.No.13a, Or (2067) - 4 Marks

A man wishes to fence a rectangular garden with 256 meter fencing material. Find the maximum area he can enclose.

Q.No.13a, or (2066)

Using derivatives, find two numbers whose sum is 10 and sum of whose squares is minimum.

Q.No.13a, or (2065)

Show that the rectangle of largest possible area for a given perimeter is a square.

Q.No.12b (2064)

Find the maximum area of a rectangular plot of land which can be enclosed by a rope of length 60 meters.

Q.No.12a (2063)

Calculate the maximum and minimum values of $x^3 - 3x^2 - 9x + 27$.

Q.No.13a, Or (2061)

A man wishes to fence a rectangular garden with 256 m. fencing material. Find the maximum area he can enclose.

Q.No.13a, Or (2060)

Find the maximum and minimum value of the function $x - 3x^3 + 6x + 5$, if exist. Also, find the point of inflexion.

Q.No.13a, Or (2059)

Show that the rectangle of largest possible area for a given perimeter is a square.

Q.No.13a Or (2058)

Show that the rectangle of largest possible area for a given perimeter is a square.

Q.No.13a Or (2057)

Find the maximum and minimum values of the function
$f(x) = 4x^3 - 6x^2 - 9x + 1$. Also find the point of inflection.

Q.No.13a, Or (2056)

Determine where the graph is concave upwards or concave downwards for
$f(x) = x^4 - 8x^3 + 18x^2 - 24$. Also find the point of inflection.

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15 | Antiderivatives and its Applications

Q.No.10b (2070) 'D'

Find the area enclosed by the axis of x and the curve $y = 3x - 5x^2$.

Q.No.5b (2070) 'D'

Evaluate: $\int \frac{1}{x} \sin(\log x) dx$

Q.No.10B (2070) 'C'

Find the area bounded by y-axis, the curve $x^2 = 4a(y - 2a)$ and $y = 6a$.

Q.No.5B (2070) 'C'

Evaluate: $\int \frac{1}{\sqrt{2x+1}-\sqrt{2x-3}} dx$

Q.No.10B (2069). Supp.

Find the area bounded by y – axis, the curve.
$x^2 = 4a(y - 2a)$ and $y = 6a$.

Q.No.5B (2069) Supp.

Evaluate: $\int x \sin ax \, dx$.

Q.No.10B (2069) Set 'B'

Find the area of the region bounded by the curves $x^2 + 4y$ and $x=y$.

Q.No.5B (2069) Set 'B'

Evaluate : $\int \frac{dx}{\sin^2 x.\cos^2 x}$

Q.No.5B (2069) Set 'A'

Evaluate: $\int \cot x (\log \sin x)^3 dx$

Q.No.10B (2068)

Find the area bounded by the curve $y^2 = 4ax$ and the line $x = a$.

Q.No.5B (2068)

Evaluate: $\int \left(1 - \frac{1}{x^2}\right) e^{x+\frac{1}{x}} dx$

Q.No.13B. Or (2067) - 4 marks

Find the area under the curves $= \frac{x^2}{16} + \frac{y^2}{25} = 1$ using method of integration.

Q.No.13B (2067) - 4 marks

Evaluate: $\int \sec^2 x \, dx$

Q.No.6C (2067) - 2 marks

Find the area under the curve $y = 2\sqrt{x}$ between $x = 0$ and $x = 1$.

Q.No.6B (2067) - 2 marks

Evaluate: $\int \frac{dx}{1+\sin x}$

Q.No.13 B. or (2066)

Find the area of the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$

Q.No.13 B (2066)

Evaluate: $\int^{3} \frac{x dx}{1+x^2}$

Q.No.6C (2066)

Find the area bounded by the curve $y = \sin x$, $x = 0$, $x = \pi$.

Q.No.6B (2066)

Evaluate: $\int \frac{dx}{\sqrt{2x+1}-\sqrt{2x-3}}$

Q.No.13B, or (2065)

Using method of integration, find the area under the curve $x^2 + y^2 = a^2$.

Q.No.13B (2065)

Evaluate: $\int e^{ax} \cos bx\, dx$

Q.No.6C (2065)

Find the area of the region bounded by the curve $y = e^x$, the x-axis and the ordinates $x = 1$; $x = 2$.

Q.No.6B (2065)

Evaluate: $\int \log x\, dx$

Q.No.13A, OR (2064)

Find the area of the circle $x^2 + y^2 = 9$ using method of integration.

Q.No.13A (2064)

Evaluate: $\int_1^2 \frac{\sin(\log x)}{x}\, dx$

Q.No.6B (2064)

Integrate = $\int \text{cosec}\, x\, dx$.

Q.No.6A (2064)

Find the area bounded by the x-axis and the following curve and ordinates $y = \log x$, $x = 1$, $x = e$

Q.No.13A, OR (2063)

Find the area of the circle $x^2 + y^2 = 25$, using method of integration.

Q.No.13A, OR (2062)

Evaluate: $\int_0^2 \frac{x\, dx}{\sqrt{x^2+4}}$

Q.No.6B (2063)

Integrate: $\int \sec x\, dx$

Q.No.6A (2063)

Find the area bounded by the x -axis and the following curve and ordinates $xy=8$; $x=3$, $x=8$.

Q.No.13B, OR (2062)

Evaluate: $\int_0^{-1} \frac{dx}{4 - x^2}$

Q.No.13B, (2062)

Find the area of the ellipse: $\frac{x^2}{9} + \frac{y^2}{16} = 1$

Q.No.6C (2062)

Find the area bounded by the x- axis and the curve and $y = \log(1+x)$ and ordinates $x = 0$ and $x = 1$

Q.No.6B (2062)

Evaluate: $\int x \sin x\, dx$.

Q.No.13B, OR (2061)

Using integration, find the area of the circle $x^2 + y^2 = a^2$.

Q.No.13B (2061)

Integrate: $\int \sec^3 x\, dx$.

Q.No.6C (2061)

Find the area bounded by curves $y = 3x^2$, $x = 1$ and $x = 3$.

Q.No.6B (2061)

Evaluate : $\int \frac{1}{x} \cos(\log x)\, dx$.

Q.No.13B. Or (2060)

Find using method of integration the area bounded by the curves $y^2 = 4x$ and $x^2 = 4y$.

Q.No.13B (2060)

Evaluate : $\int x \sin^2 x \, dx$

Q.No.6C (2060)

Find the area under the curve $y = x^2$ bounded by x-axis, and between the ordinates $x = 0$ and $x = a$.

Q.No.6B (2060)

Evaluate : $\int \sin^2 2x \, dx$.

Q.No.13B .Or (2059)

Find the area of the region between the curve $y^2 = 16x$ and the line $y = 2x$.

Q.No.13B (2059)

Evaluate $\int e^x \cos x \, dx$.

Q.No.6C (2059)

Evaluate : $\int_1^2 \frac{\sin(\log x)}{x} \, dx$.

Q.No.6B (2059)

Integrate $\int \sec x \, dx$.

Q.No.13B.Or (2058) -4 marks

Find the area bounded by the curves $y^2 = 4ax$ and $x^2 = 4ay$

Q.No.13B (2058)

Evaluate: $\int x^2 e^{ax} \, dx$

Q.No.6C (2058)

Integrate: $\int \log x \, dx$

Q.No.6B (2058)

Find the area enclose by the curve $y = 3x$, the x - axis and ordinates at $x = 0$ and $x = 4$

Q.No.13B. Or (2057)

Find the area of the circle, $x^2 + y^2 = 25$.

Q.No.13B (2057)

Integrate : $\int x^2 \sin x \, dx$.

Q.No.6C (2057)

Find the value of : $\int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} \cos t \, dt$.

Q.No.6B (2057)

Integrate: $\int x \sin x \, dx$.

Q.No.13B .Or (2056)

Find the area of the region between the curve $y^2 = 16x$ and the line $y = 2x$.

Q.No.13B (2056)

Evaluate : $\int \frac{dx}{\sqrt{a^2+x^2}}$

Q.No.6C (2056)

Integrate : $\int\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right) dx$.

Q.No.6B (2056)

Find the area bounded by the axis of x and the curve $y=4x^3$ and the ordinates at $x=2$ and $x=4$.

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