MATHS

BOOKS - OBJECTIVE RD SHARMA

ENGLISH

TANGENTS AND NORMALS

Illustration

1. For the curve $x = t^2 - 1, y = t^2 - t,$ the tangent line is perpendicular to x-axis, then

$t =$ (i)0 (ii)∞ (iii) $\frac{1}{\sqrt{3}}$ (iv) $-\frac{1}{\sqrt{3}}$

A. $t = 0$

B. $t = \infty$

C. $t = 1/\sqrt{3}$

D. $t = -1/\sqrt{3}$

Answer: A

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2. The tangent to a given cuve is perpendicualr to x-axis, if

A. $\frac{dy}{dx} = 0$

B. $\frac{dy}{dx} = 1$

C. $\frac{dx}{dy} = 0$

D. $\frac{dx}{dy} = 1$

Answer: C

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3. If normal of the curve is parallel to x axis then

A. $\frac{dy}{dx} = 0$

B. $\frac{dy}{dx} = 1$

C. $\frac{dx}{dy} = 0$

D. $\frac{dx}{dy} = 1$

Answer: C

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4. If the tangent to the curve $xy + ax + by = 0$ at $(1, 1)$ is inclined at an angle $\tan^{-1} 2$ with x-axis, then find $aandb$?

A. $a = 1, b = 2$

B. $a = 1, b = -2$

C. $a = -1, b = 2$

D. $a = -1, b = -2$

Answer: B

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5. The equation of tangent to the curve $y = be^{-x/a}$ at the point where it crosses Y-axis is

A. $(1/2, 1/4)$

B. $(1/4, 1/2)$

C. $(4, 2)$

D. $(1, 1)$

Answer: B

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6. The point on the curve $y = 12x - x^2$ where the tangent is parallel to x-axis, is

A. (0, 0)

B. (2, 16)

C. (3, 9)

D. none of these

Answer: D

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7. The slope of the tangent to the curve $x = t^2 + 3t - 8, \quad y = 2t^2 - 2t - 5$ at the point $(2, \ -1)$ is

(a)$22/7$

(b) $6/7$

(c) $7/6$

(d) $-6/7$

A. $\frac{22}{7}$

B. $\frac{6}{7}$

C. -6

D. none of these

Answer: B

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8. For the curve $x = 3\cos\theta, y = 3\sin\theta, 0 \leq \theta \leq \pi,$ the tangent is parallel to the x-axis, where $\theta =$

A. π

B. 0

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer: D

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9. The point on the curve $y = (x - 1)(x - 2)$ at which the tangent makes an angle of 135° with the positive direction of x-axis has coordinates

A. (1, 0)

B. (0, 1)

C. (-1, 0)

D. (0, -1)

Answer: A

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10. about to only mathematics

A. -1

B. $-\frac{3}{4}$

C. $-\frac{4}{3}$

D. 1

Answer: C

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11. The point(s) on the curve $y^3 + 3x^2 = 12y$ where the tangent is vertical, is(are) ? (a) $\left(\pm \frac{4}{\sqrt{3}}, -2 \right)$ (b) $\left(\pm \sqrt{\frac{11}{3}}, 1 \right)$ (c) $(0, 0)$ (d) $\left(\pm \frac{4}{\sqrt{3}}, 2 \right)$

A. $\left(\pm \frac{4}{\sqrt{3}}, -2 \right)$

B. $\left(\pm \sqrt{\frac{\pi}{3}}, 1 \right)$

C. (0, 0)

D. $\left(\pm \frac{4}{\sqrt{3}}, 2 \right)$

Answer: D

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12. If the slope of the curve $y = \frac{ax}{b - x}$ at the point (1, 1) is 2, then find a & b

A. $a = 1, b = -2$

B. $a = -1, b = 2$

C. $a = 1, b = 2$

D. none of these

Answer: C

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13. The slope of the tangent to the curve $\left(y - x^5\right)^2 = x\left(1 + x^2\right)^2$ at the point $(1, 3)$ is.

A. 4

B. 6

C. 8

D. 2

Answer: C

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14. The tangent to the curve $y = x^3$ at the point $P(t, t^3)$ cuts the curve again at point Q. Then, the coordinates of Q are

A. (0, 0)

B. $(2t, 4t^3)$

C. $(2t, 8t^3)$

D. $(-2t, -8t^3)$

Answer: D

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15. The point at which the tangent to the curve $y = x^2 - 4x$ is parallel to x-axis is

A. (0, 4)

B. (-2, 4)

C. (2,4)

D. (2, -4)

Answer: D

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16. The curve $y - e^{xy} + x = 0$ has a vertical tangent at the point:

A. (1, 1)

B. at no point

C. (0, 1)

D. (1, 0)

Answer: D

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17. The angle between the tangents to the curve $y = x^2 - 5x + 6$ at the point (2, 0) and (3, 0) is (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) π (d) $\frac{\pi}{4}$

A. $\pi/3$

B. $\pi/2$

C. $\pi/6$

D. $\pi/4$

Answer: B

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18. Write the equation of the normal to the curve $y = x + \sin x \cos x$ at $x = \frac{\pi}{2}$.

A. $x = 2$

B. $x = \pi$

C. $x + \pi = 0$

D. $2x = \pi$

Answer: D

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19. The equation of the normal to the curve $y = \sin x$ at $(0, 0)$ is

A. $x = 0$

B. $y = 0$

C. $x + y = 0$

D. $x - y = 0$

Answer: C

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20. The equation of the normal to the curve $y = x(2 - x)$ at the point (2, 0) is

A. $x - 2y = 2$

B. $x - 2y + 2 = 0$

C. $2x + y = 4$

D. $2x + y - 4 = 0$

Answer: A

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21. If the equetion of tangent to the curve $y^3 = ax^3 +$ b at point (2,3) is y = 4x = 5, then find the values of a and b.

A. $a = 2, b = 7$

B. $a = 7, b = 2$

C. $a = 2, b = -7$

D. $a = -2, b = 7$

Answer: C

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22. The tangent to the curve $y = e^{2x}$ at (0,1) meets the x-axis at

A. (0, 2)

B. (2, 0)

C. $(-1/2, 0)$

D. none of these

Answer: C

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23. if tangent to curve $2y^3 = ax^2 + x^3$ at point (a,a) cuts off intercepts α, β on co-

ordinate axes where $\alpha^2 + \beta^2 = 61$ then the value of 'a' is equal to

A. ± 30

B. ± 5

C. ± 6

D. ± 61

Answer: A

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24. The equation of the tangent to the curve $y = 1 - e^{x/2}$ at the tangent to the curve $y = 1 - e^{x/2}$ at the point of intersection with the y-axis, is

A. $x + 2y = 0$

B. $2x + y = 0$

C. $x - y = 2$

D. none of these

Answer: A

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25. The normal to the curve $x = a(1 + \cos\theta), y = a\sin\theta$ at $'\theta'$ always passes through the fixed point

A. (a, a)

B. (a, 0)

C. (0, a)

D. none of these

Answer: B

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26. The area of a triangle formed by a tangent to the curve $2xy = a^2$ and the coordinate axes, is

A. $2a^2$

B. a^2

C. $3a^2$

D. none of these

Answer: B

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27. If the tangent at a point on the ellipse $\frac{x^2}{27} + \frac{y^2}{3} = 1$ meets the coordinate axes at A and B, and the origin, then the minimum area (in sq. units) of the triangle OAB is:

A. 9

B. $\frac{9}{2}$

C. $9\sqrt{3}$

D. $3\sqrt{3}$

Answer: A

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28. Find the equation of the normal to the curve $y = (1+x)^y + \sin^{-1}\left(s \in^2 x\right)$ at $x = 0$.

A. $x + y = 2$

B. $x + y = 1$

C. $x - y = 1$

D. none of these

Answer: B

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29. The normal to the curve, $x^2 + 2xy - 3y^2 = 0, at(1, 1)$

A. meets the curve again in the third quadrant.

B. Meets the curve again the fourth quadrant .

C. does not meet the curve again.

D. meets the curve again in the second quadrant.

Answer: B

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30. The area bounded by the axes of reference and the normal to $y = \log_e x$ at (1,0), is

A. 1 sq. unit

B. 2 sq. units

C. $\frac{1}{2}$ sq. unit

D. none of these

Answer: C

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31. Consider $f(x) = \tan^{-1}\left(\sqrt{\frac{1+\sin x}{1-\sin x}}\right), c \in \left(0, \frac{\pi}{2}\right)$. A normal to $y = (x) at x = \frac{\pi}{6}$ also pasess through the point

A. (0, 0)

B. $\left(0, \frac{2\pi}{3}\right)$

C. $\left(\frac{\pi}{6}, 0\right)$

D. $\left(\frac{\pi}{4}, 0\right)$

Answer: B

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32. Let C be a curve given by $y = 1 + \sqrt{4x - 3}, x > \frac{3}{4}$. If P is a point on C

such that the tangent at P has slope $\frac{2}{3}$, then a point through which the normal at P passes, is

A. $(3, -4)$

B. $(1, 7)$

C. $(4, -3)$

D. $(2, 3)$

Answer: B

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33. The normal to the curve $y(x-2)(x-3)=x+6$ at the point where the curve intersects the y-axis , passes through the point : (1) $\left(\frac{1}{2}, -\frac{1}{3}\right)$ (2) $\left(\frac{1}{2}, \frac{1}{3}\right)$ (3) $\left(-\frac{1}{2}, -\frac{1}{2}\right)$ (4) $\left(\frac{1}{2}, \frac{1}{2}\right)$

A. $\left(-\frac{1}{2}, -\frac{1}{2}\right)$

B. $\left(\frac{1}{2}, \frac{1}{2}\right)$

C. $\left(\frac{1}{2}, -\frac{1}{3}\right)$

D. $\left(\frac{1}{2}, \frac{1}{3}\right)$

Answer: B

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34. If the curves $y = a^x$ and $y = e^x$ intersect at and angle α, then $\tan\alpha$ equals

A. $\left|\frac{\log_e a}{1+\log_e a}\right|$

B. $\left|\frac{1+\log_e a}{1+\log_e a}\right|$

C. $\left|\frac{\log_e a - 1}{\log_e a + 1}\right|$

D. none of these

Answer: C

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35. Find the angle of intersection of curve $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $x^2+y^2=ab$

A. $\tan^{-1}\left(\frac{a-b}{\sqrt{ab}}\right)$

B. $\tan^{-1}\left(\frac{a+b}{\sqrt{ab}}\right)$

C. $\tan^{-1}\left(\frac{a-b}{2\sqrt{ab}}\right)$

D. none of these

Answer: A

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36. Find the angle of intersection of the curves

$x^3 - 3xy^2 = a$ and $3x^2y - y^3 = b$

A. $\frac{\pi}{3}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{2}$

D. none of these

Answer: C

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37. If the curves $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $\frac{x^2}{c^2}+\frac{y^2}{d^2}=1$ intersect orthogonally, then

A. $a^2-b^2=c^2-d^2$

B. $a^2-c^2=b^2-d^2$

C. $a^2b^2=c^2d^2$

D. $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{c^2}+\frac{1}{d^2}$

Answer: A

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38. Show the condition that the curves $ax^2 + by^2 = 1$ and $Ax^2 + By^2 = 1$ should intersect orthogonally is $\frac{1}{a} - \frac{1}{b} = \frac{1}{A} - \frac{1}{B}$.

A. $\frac{1}{a} + \frac{1}{A} = \frac{1}{b} + \frac{1}{B}$

B. $\frac{1}{a} - \frac{1}{A} = \frac{1}{b} - \frac{1}{B}$

C. $\frac{1}{a} + \frac{1}{b} = \frac{1}{B} - \frac{1}{A}$

D. $\frac{1}{a} + \frac{1}{b} = \frac{1}{A} + \frac{1}{B}$

Answer: B

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39. If the curves $2x^2 + 3y^2 = 6$ and $ax^2 + 4y^2 = 4$ intersect orthogonally, then a =

A. 2

B. 1

C. 3

D. none of these

Answer: A

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40. The two curves $x = y^2, xy = a^3$ cut orthogonally at a point. Then a^2 is equal to $\frac{1}{3}$ (b) 3 (c) 2 (d) $\frac{1}{2}$

A. $\frac{1}{3}$

B. 3

C. 2

D. $\frac{1}{2}$

Answer: D

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41. For a curve $\frac{(\text{length of normal})}{(\text{length of tangent})}$ is equal to

A. subtangent

B. subnormal

C. slope of tangent

D. slope of normal

Answer: C

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42. Fot the curve y = f (x), prove that

$$\frac{(\text{length of normal})^2}{(\text{length of tangent})} = \frac{\text{sub-normal}}{\text{sub-tangent}}.$$

A. (subnormal)/(subtangent)

B. (subtangent)/(subnormal)

C. (tangent)/(normal)

D. constant

Answer: A

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43. At any point of a curve $\sqrt{\frac{\text{subnormal}}{\text{subtangent}}}$ is equal to

A. the abscissa of that point

B. the ordinate of that paint

C. slope of the tangent at that point

D. slope of the normal at that point

Answer: C

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44. At any point of a curve (subtangent) x (subnormal) is equal to the square of the-

A. slope of the tangent at that point

B. slope of the normal at that point

C. abscissa of that point

D. ordinate of that point

Answer: D

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45. If the tangent at P on the curve $x^m y^n = a^{m+n}$ meets the coordinate axes at A and B, then is :

A. $(\text{abscissae})^2$

B. $(\text{ordinate})^2$

C. abscissa

D. ordinate

Answer: C

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46. Find the equations of the tangent and the normal at the point $'t'$ on the curve $x = a\sin^3 t, y = b\cos^3 t$.

A. $4CT^2 = ON^2 = a^2$

B. the length of the tangent $= \left|\frac{y}{\cos t}\right|$

C. the length of the normal $= \left|\frac{y}{\sin t}\right|$

D. all the above

Answer: C

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47. The length of the normal to the curve $Y = a\left(\frac{e^{-x/a} + e^{x/a}}{2}\right)$ at any point varies as the :

A. abscissa of the point

B. ordinate of the point

C. square of the abscissa of the point

D. square of the ordinate of the point

Answer: D

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48. If at any point on a curve the surtangent and subnormal are equal, then the tangent is equal to

A. ordinate

B. $\sqrt{2}$ ordinate

C. $\sqrt{2(\text{ordinate})}$

D. none of these

Answer: B

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49. Find the length of normal to the curve $x = a(\theta + \sin\theta), y = a(1 - \cos\theta)$ at $\theta = \frac{\pi}{2}$.

A. 2a

B. $a\sqrt{2}$

C. $a/2$

D. $a/\sqrt{2}$

Answer: B

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Section I Solved Mcqs

1. The number of possible tangents which can be drawn to the curve $4x^2 - 9y^2 = 36,$ which are perpendicular to the straight line $5x + 2y - 10 = 0$, is zero (b) 1 (c) 2 (d) 4

A. $5(y-3) = 2\left(x - \frac{\sqrt{117}}{2}\right)$

B. $2x - 5y + 10 - 2\sqrt{18} = 0$

C. $2x - 5y - 10 - 2\sqrt{18} = 0$

D. none of these

Answer: D

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2. Let P be any point on the curve $x^{2/3} + y^{2/3} = a^{2/3}$. Then the length of the segment of the tangent between the coordinate axes in of length

A. 3a

B. 4a

C. 5a

D. a

Answer: D

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3. The distance between the origin and the tangent to the curve $y = e^{2x} + x^2$ drawn at the point $x = 0$ is $\left(1, \frac{1}{3}\right)$ (b) $\left(\frac{1}{3}, 1\right)$ $\left(2, -\frac{28}{3}\right)$ (d) none of these

A. $\frac{1}{\sqrt{5}}$

B. $\frac{2}{\sqrt{5}}$

C. $\frac{-1}{\sqrt{5}}$

D. $\frac{2}{\sqrt{3}}$

Answer: A

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4. The point of intersection of the tangents drawn to the curve $x^2y = 1 - y$ at the points where it is meet by he cuver xy=1-y is given by :

A. $(0, -1)$

B. $(1, 1)$

C. $(0, 1)$

D. none of these

Answer: C

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5. The equation of the tangent to the curve $y = (2x - 1)e^{2(1-x)}$ at the point of its maximum, is

A. $y = -1 = 0$

B. $x - 1 = 0$

C. $x + y - 1 = 0$

D. $x - y + 1 = 0$

Answer: A

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6. If the sum of the squares of the intercepts on the axes cut off by tangent to the curve

$x^{\frac{1}{3}} + y^{\frac{1}{3}} = a^{\frac{1}{3}}$, $a > 0$ at $\left(\frac{a}{8}, \frac{a}{8}\right)$ is 2, then

$a =$ 1 (b) 2 (c) 4 (d) 8

A. 1

B. 2

C. 4

D. 8

Answer: C

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7. The point on the curve $3y = 6x - 5x^3$ the normal at which passes through the orgin is

A. $(1, 1/3)$

B. $(1/3, 1)$

C. $(2, -28/3)$

D. $(-1, -1/3)$

Answer: A

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8. If the tangent at any point on the curve $x^4 + y^4 = c^4$ cuts off intercepts a and b on the coordinate axes, the value of $a^{-\frac{4}{3}} + b^{-\frac{4}{3}}$ is

A. $c^{-4/3}$

B. $c^{-1/2}$

C. $c^{1/2}$

D. none of these

Answer: A

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9. If the tangent at $(1, 1)$ on $y^2 = x(2 - x)^2$ meets the curve again at P, then find coordinates of P.

A. $(4, 4)$

B. $(-1, 2)$

C. $(9/4, 3/8)$

D. none of these

Answer: C

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10. What is the angle between these two curves $x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 - 2 = 0$

A. cut at right angles

B. touch each other

C. cut at an angle $\pi/3$

D. cut at an angle $\pi/4$

Answer: A

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11. If a curve with equation of the form $y = ax^4 + bx^3 + cx + d$ has zero gradient at the point (0, 1) and also touches the x-axis at the point $(-1, 0)$ then the value of x for which the curve has a negative gradient are

A. $x > -1$

B. $x < 1$

C. $x < -1$

D. $-1 \leq x \leq 1$

Answer: C

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12. In the corve $y = ce^{x/a}$, the

A. subtangent is constant

B. subnormal varies as the square of the ordinate

C. tangent at (x_1, y_1) on the curve intersects the x-axis at a distance of

$(x_1 - a)$ from the origin.

D. equation of normal at the point where the curve cuts y-axis is $cy + ax = c$

Answer: D

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13. If m is the slope of a tangent to the curve $e^y = 1 + x^2$, then (a)$|m| > 1$ (b) $m > 1$ (c) $m \geq -1$ (d) $|m| \leq 1$

A. $|m| > 1$

B. $m < 1$

C. $|m| < 1$

D. $|m| \leq 1$

Answer: D

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14. about to only mathematics

A. on the left of x=c

B. on the right of x=c

C. at no point

D. at all point

Answer: A

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15. If $x + y = k$ is normal to $y^2 = 12x,$ then k is (a)3 (b) 9 (c) -9 (d) -3

A. 3

B. 9

C. -9

D. -3

Answer: B

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16. If the line $ax + by + c = 0$ is a tangent to the curve $xy = 9,$ then

A. $a > 0, b > 0$

B. $a > 0, b < 0$

C. $a < 0, b > 0$

D. $a < 0, b < 0$

Answer: A::D

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17. The lengths of tangent, subtangent, normal and subnormal for the curve $y = x^2 + x - 1$ at (1,1) are A,B,C and D respectively, then their increasing order is

A. B,D,A,C

B. B,A,C,D

C. A,B,C,D

D. B,A,D,C

Answer: D

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18. If at each point of the curve $y = x^3 - ax^2 + x + 1,$ the tangent is inclined at an acute angle with the positive

direction of the x-axis, then (a)$a > 0$ (b) $a < -\sqrt{3}$ (c)$-\sqrt{3} \leq a \leq \sqrt{3}$ (d) $noneofthese$

A. $a > 0$

B. $a \leq \sqrt{3}$

C. $|a| \leq \sqrt{3}$

D. none of these

Answer: C

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19. If the line $y = 2x$ touches the curve $y = ax^2 + bx + c$ at the point where x=1 and the curve passes through the point (-1,0), then

A. $a = \frac{1}{2}, b = 1, c = \frac{1}{2}$

B. $a = 1, b = \frac{1}{2}, c = \frac{1}{2}$

C. $a = \frac{1}{2}, c = \frac{1}{2}, b = 1$

D. none of these

Answer: A

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20. If the line joining the points $(0, 3)$ and $(5, -2)$ is a tangent to the curve $y = \frac{C}{x+1}$, then the value of C is (a) 1 (b) -2 (c) 4 (d) none of these

A. 1

B. -2

C. 4

D. none of these

Answer: C

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21. If $y = f(x)$ be the equation of the line touching the line $y = 2x + 3$ at $x = 2$, then

A. $f'(2) = 3$

B. $2f(2) = 7f'(2)$

C. $f(2) + f'(2) + f''(2) = 2$

D. none of these

Answer: B

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22. The slope of the tangent of the curve $y = \int_0^x \frac{dx}{1+x^3}$ at the point where $x = 1$ is

A. $\frac{1}{2}$

B. 1

C. $\frac{1}{4}$

D. non-existent

Answer: A

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23. Prove that the curve $y = e^{|x|}$ cannot have a unique tangent line at the point $x = 0$. Find the angle between the one-sided tangents to the curve at the point $x = 0$.

A. $\frac{\pi}{4}$

B. $\frac{\pi}{6}$

C. $\frac{\pi}{2}$

D. $\frac{\pi}{3}$

Answer: C

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24. The curve $y = ax^3 + bx^2 + cx + 5$ touches the x-axis at $P(-2, 0)$ and cuts the y-axis at the point Q where its gradient is 3. Find the equation of the curve completely.

A. $a = \frac{1}{2}, b = -\frac{3}{4}, c = 3$

B. $a = -\frac{1}{2}, b = -\frac{3}{4}, c = 3$

C. $a = \frac{1}{2}, b = \frac{3}{4}, c = 3$

D. none of these

Answer: B

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25. If the curve $y = x^2 + bx + c$ touches the line y = x at the point (1,1), then the set of values of x for which the curve has a negative gradient is

A. $(-\infty, 1/2)$

B. $(1/2, \infty)$

C. $(-\infty, -1/2)$

D. $(-1/2, \infty)$

Answer: A

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26. The tangent to the curve $\sqrt{x} + \sqrt{y} = \sqrt{a}$ at any poin on it cuts the axes Ox and Oy at P and Q respectively then $OP + OQ$ is

A. 2a

B. a

C. $\frac{a}{2}$

D. none of these

Answer: B

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27. The angle between the curves $y = \sin x$ and $y = \cos x, 0 < x < \frac{\pi}{2}$, is

A. $\pm \tan^{-1} \sqrt{2}$

B. $\pm \tan^{-1} 2\sqrt{2}$

C. $\pm \tan^{-1} \frac{1}{\sqrt{2}}$

D. none of these

Answer: B

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28. If the tangent at each point of the curve

$$y = \frac{2}{3}x^3 - 2ax^2 + 2x + 5$$

makes an acute angle with the positive direction of x-axis, then

A. $a \geq 1$

B. $-1 \leq a \leq 1$

C. $a \leq -1$

D. none of these

Answer: B

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29. Let the parabolas $y = x(c - x) and y = x^2 + ax + b$ touch each other at the point (1,0). Then

$a+b+c=0 \quad a+b=2 \quad b-c=1$ (d)

$a+c=-2$

A. 1

B. -1

C. 0

D. none of these

Answer: C

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30. Let $y = f(x)$ be a parabola, having its axis parallel to the y-axis, which is touched by the line $y = x$ at $x = 1$. Then, $2f(0) = 1 - f'(0)$ (b) $f(0) + f'(0) + f^0 = 1$ $f'(1) = 1$ (d) $f'(0) = f'(1)$

A. $f'(0) = f'(1)$

B. $f'(1) = -1$

C. $f(0) + f'(0) + f''(0) = 1$

D. $2f(0) = 1 - f'(0)$

Answer: D

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31. Find the value of $n \in N$ such that the curve $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ touches the straight line $\frac{x}{a} + \frac{y}{b} = 2$ at the point (a, b).

A. (b, a)

B. (a, b)

C. $(1, 1)$

D. $\left(\frac{1}{b}, \frac{1}{a}\right)$

Answer: B

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32. The normal to the curve $2x^2 + y^2 = 12$ at the point $(2, 2)$ cuts the curve again at (a) $\left(-\frac{22}{9}, -\frac{2}{9}\right)$ (b) $\left(\frac{22}{9}, \frac{2}{9}\right)$ $(-2, -2)$ (d) none of these

A. $(-22/9, -2/9)$

B. $(22/9, 2/9)$

C. $(-2, -2)$

D. none of these

Answer: A

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33. A tangent to the curve $y = \int_0^x |t| dt$, which is parallel to the line $y = x$, cuts off an intercept from the y-axis is equal to

A. 1

B. $\frac{-1}{2}, \frac{1}{2}$

C. $\frac{1}{2}, 1$

D. -1

Answer: B

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34. The equation of the normal to the curve $y = e^{-2|x|}$ at the point where the curve cuts the line $x = -\frac{1}{2}$, is

A. $2e(ex + 2y) = 4 - e^2$

B. $2e(ex - 2y) = e^2 - 4$

C. $2e(ey - 2x) = e^2 - 4$

D. $2e(ey + 2x) = e^2 - 4$

Answer: A

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35. The equation of the normal to the curve $y = x^{-x}$ at the point of its maximum is

A. $x = e$

B. $x = e^{-1}$

C. $y = e$

D. $y = e^{-1}$

Answer: B

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36. The abscissa of a point on the curve $xy = (a + x)^2$, the normal which cuts off numerically equal intercepts from the coordinate axes, is (a) $-\frac{1}{\sqrt{2}}$ (b) $\sqrt{2}a$ (c) $\frac{a}{\sqrt{2}}$ (d) $-\sqrt{2}a$

A. $\frac{a}{\sqrt{2}}$

B. a

C. $\sqrt{2}a$

D. $-\frac{a}{\sqrt{2}}$

Answer: A::D

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37. Let $f(x) = \sin x - \tan x, x \in (0, \pi/2)$ then tangent drawn to the curve $y = f(x)$ at any point will

A. lie above the curve

B. lie below the curve

C. nothing can be said

D. be parallel to a fixed line.

Answer: A

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38. If the tangent at a point P with parameter t, on the curve $x = 4t^2 + 3$, $y = 8t^3 - 1$

$t \in R$ meets the curve again at a point Q, then the coordinates of Q are

A. $\left(\frac{35}{9}, \pm \frac{16\sqrt{2}}{27} - 1\right)$

B. $\left(\frac{25}{9}, \perp \frac{11}{7}\right)$

C. $\left(\frac{35}{9}, \pm \frac{16\sqrt{2}}{27} + 1\right)$

D. none of these

Answer: A

Watch Video Solution

39. If the tangent to the curve $xy + ax + by = 0$ at $(1, 1)$ is inclined at an angle $\tan^{-1} 2$ with x-axis, then find a and b?

A. 0

B. $\frac{1}{2}$

C. $-\frac{1}{2}$

D. none of these

Answer: B

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40. The slope of the tangent to the curve $y = \int_x^{x^2} \cos^{-1} t^2 dt$ at $x = \frac{1}{\sqrt[4]{2}}$ is

A. $\left(\frac{\sqrt[4]{8}}{2} - \frac{3}{4}\right)\pi$

B. $\left(\frac{\sqrt[4]{8}}{3} - \frac{1}{4}\right)\pi$

C. $\left(\frac{\sqrt[5]{8}}{4} - \frac{1}{3}\right)\pi$

D. none of these

Answer: B

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41. The equation of the curve is $y - f(x)$. The tangents at $[1, f(1)[, [2, f(2)]$ and $[3, f(3)]$ make angles $\frac{\pi}{6}, \frac{\pi}{3}$ and $\frac{\pi}{4}$, respectively with the positive direction of x-axis. Then the value of $\int_2^3 f'(x)f''(x)dx + \int_1^3 f''(x)dx$ is equal to

A. $-\frac{1}{\sqrt{3}}$

B. $\frac{1}{\sqrt{3}}$

C. 0

D. none of these

Answer: A

Watch Video Solution

42. Let C be the curve $y - 3xy + 2 = 0$ If H is the set of points on the curve C, where the tangent is horizontal and V is the set of points on the curve C, where the tangent is vertical, then H =_____ and V = _____

A.

$$H = \{(x, y) : y = 0, x \in R\}, V = \{(1, 1)\}$$

B.

$$H = \{(x, y) : x = 0, y \in R\}, V = \{(1, 1)\}$$

C. $H = \phi, V = \{(1, 1)\}$

D.

$$H = \{(1, 1)\}, V = \{(x, y) : y = 0, x \in R\}$$

Answer: C

 Watch Video Solution

43. If $\sin\theta$ is the acute angle between the curves

$x^2 + y^2 = 4x$ and $x^2 + y^2 = 8$ at $(2, 2)$,

then $\theta =$

A. 1

B. 0

C. $1/\sqrt{2}$

D. $\sqrt{3}/2$

Answer: C

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44. If curve $x^2 = 9a(9 - y)$ and $x^2 = a(y + 1)$ intersect orthogonally then value of 'a' is

A. 3

B. 4

C. 5

D. 7

Answer: B

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45. The equation of the tangent to the curve $y = x + \frac{4}{x^2}$, that is parallel to the x-axis, is

(1) $y = 1$ (2) $y = 2$ (3) $y = 3$ (4) $y = 0$

A. $y = 2$

B. $y = 3$

C. $y = 0$

D. $y = 1$

Answer: B

Watch Video Solution

46. The equation of the normal to the parabola, $x^2 = 8y$ at $x = 4$ is

A. $x + y = 6$

B. $x + 2y = 0$

C. $3 - 2y = 0$

D. $x + y = 2$

Answer: A

Watch Video Solution

47. The intercepts on x- axis made by tangents to the curve, $y = \int_0^x |t| dt, x \varepsilon R$ which are parallel to the line $y = 2x$, are equal to

A. ± 1

B. ± 2

C. ± 3

D. ± 4

Answer: A

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48. The least positive vlaue of the parameter 'a' for which there exist atleast one line that is tangent to the graph of the curve $y = x^3 - ax,$ at one point and normal to the graph at another point is $\frac{p}{q},$ where p and q ar relatively prime positive integers. Find product pq.

A. $(-\infty, -4/3]$

B. $[-4/3, \infty)$

C. $[4/3, \infty)$

D. $(-\infty, 4/3]$

Answer: C

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49. If the tangent at a point P with parameter t, on the curve $x = 4t^2 + 3$, $y = 8t^3 - 1$ $t \in R$ meets the curve again at a point Q, then the coordinates of Q are

A. $\left(t^2+3,\ -t^3-1\right)$

B. $\left(t^2+3, t^3-1\right)$

C. $\left(16t^2+3,\ -64t^3-1\right)$

D. $\left(4t^2+3,\ -8t^3-1\right).$

Answer: A

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Exercise

1. The equation of the tangents to $2x^2 + 3y^2 = 36$ which are parallel to the straight line $x + 2y - 10 = 0,$ are

A. $x + 2y = 0$

B. $x + 2y + \sqrt{\frac{288}{15}} = 0$

C. $x + 2y + \sqrt{\frac{1}{15}} = 0$

D. none of these

Answer: D

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2. If the area of the triangle included between the axes and any tangent to the curve $x^n y = a^n$ is constant, then find the value of n.

A. 1

B. 2

C. $3/2$

D. $1/2$

Answer: A

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3. Show that the curves $x = y^2 and xy = k$ cut at right angles, if $8k^2 = 1$

A. $2k^2 - 1$

B. $4k^2 = 1$

C. $6k^2 = 1$

D. $8k^2 = 1$

Answer: D

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4. Find the euation of normal to the curve $x = a(\cos\theta + \theta\sin\theta), y = a(\sin\theta - \theta\cos\theta)$ at any point $'\theta'$

A. makes a constant angle with x-axis

B. is at a constant distance from the origin

C. passes through the origin

D. satisfies all the three conditions

Answer: B

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5. The equation of the tangent to the curve $x = t\cos t, y = t\sin t$ at the origin, is

A. $x = 0$

B. $y = 0$

C. $x + y = 0$

D. $x - y = 0$

Answer: B

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6. The equation of the normal to the curve $y^4 = ax^3$ at (a, a) is

A. $x + 2y = 3a$

B. $3x - 4y + a = 0$

C. $4x + 3y = 7a$

D. $4x - 3y = a$

Answer: C

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7. The angle between the curves $y^2 = 4x + 4$ and $y^2 = 36(9 - x)$ is?

A. 30°

B. 45°

C. 60°

D. 90°

Answer: D

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8. The equation of the tangent to the curve $y = x^4$ from the point (2,0) , are given by

A. $y = \frac{4098}{81}$

B. $y - 1 = 5(x - 1)$

C. $y = \frac{4096}{81} = \frac{2048}{27}\left(x - \frac{8}{3}\right)$

D. $y - \frac{32}{243} = \frac{80}{81}\left(x - \frac{2}{3}\right)$

Answer: C

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9. The point on the curve $\sqrt{x} + \sqrt{y} = \sqrt{a}$, the normal at which is parallel to the x-axis, is

A. (0, 0)

B. (0, a)

C. (a, 0)

D. (a, a)

Answer: B

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10. The length of the Sub tangent at $(2, 2)$ to the curve $x^5 = 2y^4$ is

A. $5/2$

B. $8/5$

C. $2/5$

D. $5/8$

Answer: B

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11. The angle between the curves $y = \sin x$ and $y = \cos x, 0 < x < \frac{\pi}{2}$, is

A. $\tan^{-1}(2\sqrt{2})$

B. $\tan^{-1}(3\sqrt{2})$

C. $\tan^{-1}(3\sqrt{3})$

D. $\tan^{-1}(5\sqrt{2})$

Answer: A

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12. The line, which is parallel to X-axis and crosses the curve $y = \sqrt{x}$ at an angle 45°, is

A. $y = \frac{1}{4}$

B. $y = \frac{1}{2}$

C. $y = 1$

D. $y = 4$

Answer: B

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13. A normal is drawn to parabola $y^2 = 4ax$ at any point other than the vertex. If it cuts the parabola again at a point whose distance from the vertex is not less than:

A. $t_1 t_2 = -1$

B. $t_2 = -t_1 - \frac{2}{t_1}$

C. $2t_1 = t_2$

D. none of these

Answer: B

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14. If the line $ax + by + c = 0$ is a normal to the curve $xy = 1$, then $a > 0, b > 0$ $a > 0, b < 0$ $a\langle 0, b\rangle 0$ (d) $a < 0, b < 0$ none of these

A. $(a > 0, b > 0)$ or , $(a < 0, b < 0)$

B. $(a > 0, b < 0)$ or , $(a < 0, b > 0)$

C. $(b \leq 0, a \leq 0)$ or , $(a \geq 0, b \leq 0)$

D. $(a \leq 0, b \leq 0)$ or , $(a \geq 0, b \geq 0)$

Answer: B

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15. Show that the line $\frac{d}{a} + \frac{y}{b} = 1$ touches the curve $y = be^{-\frac{x}{a}}$ at the point where it crosses the y-axis.

A. $(a, b/a)$

B. $(-a, b/a)$

C. $(a, a/b)$

D. none of these

Answer: D

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16. Find the euation of normal to the curve $x = a(\cos\theta + \theta\sin\theta), y = a(\sin\theta - \theta\cos\theta)$ at any point $'\theta'$

A. it makes a constant angle with x-axis

B. it passes through the origin

C. it is at a constant distance from the origin

D. none of these

Answer: C

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17. The point P of the curve $y^2 = 2x^3$ such that the tangent at P is perpendicular to the line $4x - 3y + 2 = 0$ is given by

A. $(2, 4)$

B. $\left(1, \sqrt{2}\right)$

C. $(1/2, -1/2)$

D. $(1/8, -1/16)$

Answer: D

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18. Find the equation of tangents to the curve $y = \cos(x + y), \ -2\pi \leq x \leq 2\pi$ that are parallel to the line $x + 2y = 0$.

A. $x + 2y = 1$

B. $x + 2y = \frac{\pi}{2}$

C. $x + 2y = \frac{\pi}{4}$

D. none of these

Answer: B

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19. The equation of the tangents at the origin to the curve $y^2 = x^2(1 + x)$ are

A. $y = \pm x$

B. $x = \pm y$

C. $y = \pm 2x$

D. none of these

Answer: A

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20. The coordinates of the points on the curve $x = a(\theta + \sin\theta), y = a(1 - \cos\theta),$ where tangent is inclined an angle $\frac{\pi}{4}$ to the x-axis are- (A) (a, a) (B) $\left(a\left(\frac{\pi}{2} - 1\right), a\right)$ (C) $\left(a\left(\frac{\pi}{2} + 1\right), a\right)$ (D) $\left(a, a\left(\frac{\pi}{2} + 1\right)\right)$

A. (a, a)

B. $(a(\pi/2 - 1), a)$

C. $(a(\pi/2+1), a)$

D. $(a, a(\pi/2+1))$

Answer: C

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21. The chord joining the points where x= p and x= q on the curve $y = ax^2 + bx + c$ is parallel to the tangent at the point on the curve whose abscissa is :

A. $\frac{1}{2}(p+q)$

B. $\frac{1}{2}(p-q)$

C. $\frac{pq}{2}$

D. none of these

Answer: A

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22. Find the locus of point on the curve $y^2 = 4a\left(x + a\sin\left(\frac{x}{a}\right)\right)$ where tangents are parallel to the axis of x.

A. circle

B. parabola

C. line

D. none of these

Answer: B

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23. At what points on the curve $y = x^2 - 4x + 5$ is the tangent perpendicular to the line $2y + x = 7$?

A. (3, 2)

B. (1, 2)

C. (2, 1)

D. none of these

Answer: A

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24. The points of contact of the tangents drawn from the origin to the curve y=sinx, lie on the curve

A. $x^2 - y^2 = xy$

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

C. $x^2 - y^2 = x^2y^2$

D. none of these

Answer: C

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25. If the area of the triangle included between the axes and any tangent to the curve $x^n y = a^n$ is constant, then find the value of n.

A. -1

B. -2

C. 1

D. 2

Answer: C

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26. The tangents to the curve $x = a(\theta - \sin\theta), y = a(1 + \cos\theta)$ at the points $\theta = (2k + 1)\pi, k \in Z$ are parallel to :

A. $y = x$

B. $y = -x$

C. $y = 0$

D. $x = 0$

Answer: C

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27. The slope of the tangent to the curve $y = \sin^{-1}(\sin x)$ at $x = \frac{3\pi}{4}$ is

A. 1

B. -1

C. 0

D. non-existent

Answer: B

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28. The slope of the tangent to the curve

$y = \cos^{-1}(\cos x) \quad \text{at} \quad x = -\frac{\pi}{4}$, is

A. 1

B. 0

C. 2

D. -1

Answer: D

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29. The equation of the tangent to the curve $y = e^{-|x|}$ at the point where the curve cuts the line x = 1, is

A. $x + y = e$

B. $e(x + y) = 1$

C. $y + ex = 1$

D. none of these

Answer: D

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30. The number of points on the curve $y = x^3 - 2x^2 + x - 2$ where tangents are prarllel to x-axis, is

A. 0

B. 1

C. 2

D. 3

Answer: C

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31. The angle between the tangents to the curve $y = x^2 - 5x + 6$ at the point (2, 0) and (3, 0) is (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) π (d) $\frac{\pi}{4}$

A. $\pi/3$

B. $\pi/4$

C. $\pi/2$

D. $\pi/6$

Answer: C

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32. The slope of the tangent to the curve $y = \sqrt{9 - x^2}$ at the point where ordinate and abscissa are equal, is

A. 1

B. -1

C. 0

D. none of these

Answer: B

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33. The slope of the tangent to the curve $y = x^2 - x$ at the point where the line y = 2 cuts the curve in the first quadrant, is

A. 2

B. 3

C. -3

D. none of these

Answer: B

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34. The abscissa of the point on the curve $ay^2 = x^3$, the normal at which cuts off equal intercepts from the coordinate axes is

A. $\frac{2a}{9}$

B. $\frac{4a}{9}$

C. $-\frac{4a}{9}$

D. $-\frac{2a}{9}$

Answer: B

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35. The curve given by $x + y = e^{xy}$ has a tangent parallel to the y-axis at the point (a) $(0, 1)$ (b) $(1, 0)$ (c)$(1, 1)$ (d) none of these

A. (0, 1)

B. (1, 0)

C. (1, 1)

D. none of these

Answer: B

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36. The two tangents to the curve $ax^2 + 2hxy + by^2 = 1, a > 0$ at the points where it crosses x-axis, are

A. parallel

B. perpendicular

C. inclined at an angle of $\pi/4$

D. none of these

Answer: A

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37. Let $P(2, 2)$ and $Q(1/2, -1)$ be two points on the parabola $y^2 = 2x$, The coordinates of the point R on the parabola

$y^2 = 2x$ where the tangent to the curve is parallel to the chord PQ, are

A. $(2, -1)$

B. $(1/8, 1/2)$

C. $(\sqrt{2}, 1)$

D. $(-\sqrt{2}, 1)$

Answer: C

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38. Any tangent to the curve $y = 2x^5 + 4x^3 + 7x + 9$

A. is parallel to x-axis

B. is parallel to y-axis

C. makes an acute angle with the x-axis

D. makes an obtuse angle with x-axis

Answer: C

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39. The normal to the curve $5x^5 - 10x^3 + x - 2y + 6 = 0$ at P (0, 3) meets the curve again at two points. Then the points are :

A. (-1, 1), (1, 5)

B. (1, -1), (-1, -5)

C. (-1, -5),(-1, 1)

D. (-1, 5),(1, -1)

Answer: B

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40. The lines parallel to the normal to the curve $xy = 1$ is/are $3x + 4y + 5 = 0$ (b) $3x - 4y + 5 = 0$ $4x + 3y + 5 = 0$ (d) $3y - 4x + 5 = 0$

A. $3x + 4y + 5 = 0$

B. $3x - 4y + 5 = 0$

C. $4x + 3y + 5 = 0$

D. $3y - 4x - 5 = 0$

Answer: B::D

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41. Let P be the point (other than the origin) of intersection of the curves $y^2 = 4ax$ and $ay^2 = 4x^3$ such that the normals to the two curves meet x-axis at G_1 and G_2 respectively. Then, $G_1G_2 =$

A. 2a

B. 4a

C. a

D. none of these

Answer: B

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42. If the sum of the squares of the intercepts on the axes cut off by the tangent to the curve $x^{1/3} + y^{1/3} = a^{1/3}(\text{ with } a > 0)$ at $(a/8, a/8)$ is 2, then a has the value

A. 1

B. 2

C. 4

D. 8

Answer: C

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Chapter Test

1. The abscissa of the point on the curve $ay^2 = x^3$, the normal at which cuts off equal

intercepts from the coordinate axes, is

A. $2a/9$

B. $4a/9$

C. $-4a/9$

D. $-2a/9$

Answer: B

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2. If the curves $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and $\frac{x^2}{l^2}-\frac{y^2}{m^2}=1$cut each other orthogonally then.....

A. $a^2+b^2=l^2+m^2$

B. $a^2-b^2=l^2-m^2$

C. $a^2-b^2=l^2+m^2$

D. $a^2+b^2=l^2-m^2$

Answer: C

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3. The length of normal at any point to the curve, $y = c\cosh\left(\frac{x}{c}\right)$ is

A. $\frac{(\text{abscissa})^2}{c}$

B. $\frac{(\text{ordinate})^2}{c}$

C. abscissa

D. ordinate

Answer: B

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4. If the sub-normal at any point on $y = a^{1-n}x^n$ is of constant length, then find the value of n.

A. 1

B. $1/2$

C. 2

D. -2

Answer: B

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5. The angle of intersection of the curves $y = x^2, 6y = 7 - x^3$ at (1, 1), is

A. $\pi/4$

B. $\pi/3$

C. $\pi/2$

D. none of these

Answer: C

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6. The slope of the tangent to the curve $x = t^2 + 3t - 8, \quad y = 2t^2 - 2t - 5$ at the point $(2, \ -1)$ is

(a)$22/7$

(b) $6/7$

(c) $7/6$

(d) $-6/7$

A. $22/7$

B. $6/7$

C. -6

D. none of these

Answer: B

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7. What is the angle between these two curves

$x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 - 2 = 0$

A. 45°

B. 60°

C. 90°

D. 30°

Answer: C

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8. about to only mathematics

A. $\tan^{-1} t^2$

B. $\cot^{-1} t^2$

C. $\tan^{-1} t$

D. $\cot^{-1} t$

Answer: C

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9. If y=4x-5 is a tangent to the curve $y^2 = px^3 + q$ at (2, 3), then:

A. p = 2, q = -7

B. p = -2, q = 7

C. p = -2, q = -7

D. p = 2, q = 7

Answer: A

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10. The curve $y - e^{xy} + x = 0$ has a vertical tangent at the point:

A. (1, 1)

B. at no point

C. (0, 1)

D. (1, 0)

Answer: D

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11. The tangent to the curve given by $x = e^t \cos t y = e^t \ \sin \mathrm{t} \ \text{at t} \ = \frac{\pi}{4}$ makes with x-axis an angle of

A. 0

B. $\pi / 4$

C. $\pi / 3$

D. $\pi / 2$

Answer: D

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12. The length of the normal at t on the curve

$x = a(t + \sin t), y = a(1 - \cos t),$ is

A. $a \sin t$

B. $2a\sin^3 \frac{t}{2} \sec \frac{t}{2}$

C. $2a\sin \frac{t}{2} \tan \frac{t}{2}$

D. $2a\sin \frac{t}{2}$

Answer: C

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13. For the parabola $y^2 = 4ax$, the ratio of the subtangent to the abscissa, is

A. $1:1$

B. $2:1$

C. $x:y$

D. $x^2:y$

Answer: B

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14. The length of the subtangent to the curve $\sqrt{x} + \sqrt{y} = 3$ at the point (4, 1), is

A. 2

B. $1/2$

C. 3

D. 4

Answer: A

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15. Find the euation of normal to the curve $x = a(\cos\theta + \theta\sin\theta), y = a(\sin\theta - \theta\cos\theta)$ at any point $'\theta'$

A. it makes a constant angle with x-axis

B. it passes through the origin

C. it is at a constant distance from the origin

D. none of these

Answer: C

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16. Tangents ar drawn to $y = \cos x$from origin then points of contact for these tangents will always lie on :

A. $x^2y^2 = y^2 - x^2$

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

C. $x^2y^2 = x^2 - y^2$

D. none of these

Answer: C

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17. If m denotes the slope of the normal to the curve $y = -3\log\left(9 + x^2\right)$ at the point $x \neq 0$, then,

A. $m \in [-1, 1]$

B. $m \in R - (-1, 1)$

C. $m \in R - [-1, 1]$

D. $m \in (-1, 1)$

Answer: B

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18. If m be the slope of the tangent to the curve $e^{2y} = 1 + 4x^2$, then

A. $m < 1$

B. $|m| \leq 1$

C. $|m| \geq 1$

D. none of these

Answer: B

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19. If the curve $y = ax^3 + bx^2 + cx$ is inclined at 45° to x-axis at (0, 0) but touches x-axis at (1, 0) , then

A. a= 1, b = -2, c = 1

B. a = 1, b = 1, c = -2

C. a = -2, b = 1, c = 1

D. a = -1, b = 2, c = 1

Answer: A

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20. If the curve $y = ax^2 + bx + c$ passes through the point (1, 2) and the line y = x touches it at the origin, then

A. a = 1, b = -1, c = 0

B. a = 1, b = 1, c = 0

C. a = -1, b = 1, c = 0

D. none of these

Answer: B

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21. The angle between the tangents to the curve $y^2 = 2ax$ at the point where $x = \frac{a}{2}$, is

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: D

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22. The intercepts on x- axis made by tangents to the curve, $y = \int_0^x |t| dt, x \varepsilon R$ which are

parallel to the line $y = 2x$, are equal to

A. 1, -1

B. $-2, 2$

C. 3

D. -3

Answer: B

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23. Find the value of $n \in N$ such that the curve $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ touches the straight line $\frac{x}{a} + \frac{y}{b} = 2$ at the point (a, b).

A. n = 2 only

B. n = -3 only

C. any $n \in R$

D. none of these

Answer: C

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24. The equation of the normal to the curve $y = e^{-2|x|}$ at the point where the curve cuts the line $x = 1/2$ is

A. $2e(ex + 2y) = e^2 - 4$

B. $2e(ex - 2y) = e^2 - 4$

C. $2e(ey - 2x) = e^2 - 4$

D. none of these

Answer: B

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25. The length of subtangent to the curve $x^2 + xy + y^2 = 7$ at the point $(1, -3)$ is

A. 3

B. 5

C. 15

D. $3/5$

Answer: C

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