MATHS

BOOKS - MODERN PUBLICATION MATHS (KANNADA ENGLISH)

APPLICATION OF DERIVATIVES

Multiple Choice Questions Level I Select The Correct Answer

1. The value of 'c' in Rolle's theorem for the function $f(x) = x^3 - 3x$ in the interval $[0, \sqrt{3}]$ is :

A. 1

B. -1

C. $\frac{3}{2}$

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

Answer: A

Watch Video Solution

2. The abscissa of the point on the curve $3y = 6x - 5x^3$, the normal at which passes through origin is :

A. 1

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

C. 2

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

Answer: A

Watch Video Solution

3. The two curves $x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 - 2 = 0$

A. touch each other

B. cut at right angle

C. cut at an angle $\frac{\pi}{3}$

D. cut at an angle $\frac{\pi}{4}$

Answer: B

Watch Video Solution

4. The tangent to the curve given by :

$x = e^t \cos t, y = e^t \sin t$ at $t = \frac{\pi}{4}$

makes with x-axis an angle :

A. 0

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

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

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

Answer: D

Watch Video Solution

5. 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

Watch Video Solution

6. The point on the curve $y^2 = x$, where the tangent makes an angle of $\frac{\pi}{4}$ with x-axis is :

A. $\left(\frac{1}{2}, \frac{1}{4}\right)$

B. $\left(\frac{1}{4}, \frac{1}{2}\right)$

C. $(4, 2)$

D. $(1, 1)$

Answer: B

Watch Video Solution

7. The maximum value of $\sin x + \cos x$ is :

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

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

C. $\sqrt{2}$

D. $2\sqrt{2}$

Answer: C

Watch Video Solution

8. At $x = \frac{5\pi}{6}, f(x) = 2\sin 3x + 3\cos 3x$ is :

A. maximum

B. minimum

C. zero

D. neither maximum nor minimum.

Answer: D

Watch Video Solution

9. $f(x) = x^x$ has a stationary point at :

A. $x = e$

B. $x = \frac{1}{e}$

C. $x = 1$

D. $x = \sqrt{e}$

Answer: B

Watch Video Solution

10. The largest interval for which :

$x^{12} - x^9 + x^4 - x + 1 > 0$ is :

A. $-4 < x \leq 0$

B. $0 < x < 1$

C. $-100 < x < 100$

D. $-\infty < x < \infty$

Answer: D

Watch Video Solution

11. Let f and g be increasing and decreasing functions respectively from $[0, \infty)$ to $[0, \infty)$, Let $h(x) = f(g(x))$. If $h(0) = 0$, then $h(x) - h(1)$ is :

A. less than - h(1)

B. always +ve

C. always -ve

D. strictly increasing.

Answer: A

View Text Solution

12. If the line $ax + by + c = 0$ is a normal to the curve $xy = 1$, then :

A. $a > 0, b > 0$

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

C. $a < 0, b < 0$

D. None of these.

Answer: B

Watch Video Solution

13. The curve $y = x^{1/5}$ has at (0, 0) :

A. a vertical tangent

B. a horizontal tangent

C. an oblique tangent

D. no tangent.

Answer: A

Watch Video Solution

14. If $y = a\log x + bx^2 + x$ has its extreme values at x = -1 and x = 2, then :

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

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

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

D. None of these.

Answer: C

Watch Video Solution

15. Let $P(x) = a_0 + a_1x^2 + a_2x^4 + a_3x^6 + \ldots\ldots + a_nx^{2n}$ be a polynomial in a real variable x with $0 < a_0 < a_1 < a_2 < \ldots\ldots\ldots < a_n$. The function P(x) has :

A. neither max. nor min.

B. only on max.

C. only one max. and one mini.

D. only one minima.

Answer: D

Watch Video Solution

16. The maximum value of $\frac{\log x}{x}$ is :

A. 1

B. $2/e$

C. e

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

Answer: D

Watch Video Solution

17. If the slope of the normal to the curve $x^3 = 8a^2y$, $a > 0$ at a point in the first quadrant is $-\frac{2}{3}$, then the point is :

A. $(2a, \ -a)$

B. $(2a, a)$

C. $(a, 2a)$

D. $(- a, a)$.

Answer: B

Watch Video Solution

18. If a differentiable function f(x) has a relative minimum at x = 0, then the function $y = f(x) + ax + b$ has a relative minimum at x = 0 for :

A. all a and all b

B. all $b > 0$

C. all b if $a = 0$

D. all $a > 0$

Answer: C

Watch Video Solution

19. The function $f(x) = x^3 - 3x$ is :

A. increasing in $(-\infty, -1) \cup [1, \infty)$ and decreasing in (-1, 1)

B. decreasing in $(-\infty, -1) \cup [1, \infty)$ and increasing in (-1, 1)

C. increasing in $(0, \infty)$ and decreasing in $(-\infty, 0)$

D. decreasing in $(0, \infty)$ and increasing in $(-\infty, 0)$.

Answer: A

Watch Video Solution

20. The number of values of k for which the equation $x^3 - 3x + k = 0$ has two distinct roots lying in the interval (0, 1) is :

A. 3

B. 2

C. infinitely many

D. no value of k satisfies the requirement.

Answer: D

Watch Video Solution

21. The point on the curve $y=(x-3)^2$, where the tangent is parallel to the chord joining (3, 0) and (4, 1) is :

A. $(-7/2, 1/4)$

B. $(5/2, 1/4)$

C. $(-5/2, 1/4)$

D. $(7/2, 1/4)$

Answer: D

Watch Video Solution

22. The length of the tangent of the curve $y = x^2 + 2$ at (1, 3) is

(A) $\sqrt{5}$

(B) $3\sqrt{5}$

(C) $\frac{3}{2}$

(D) $\frac{3\sqrt{5}}{2}$

Watch Video Solution

23. The slope of the normal to the curve :

$x = a(\cos\theta + \theta\sin\theta), y = a(\sin\theta - \theta\sin\theta)$

at any point $'\theta'$ is :

A. $-\cot\theta$

B. $-\tan\theta$

C. $\cot\theta$

D. $\tan\theta$

Answer: A

Watch Video Solution

24. A stone is projected vertically upwards moves under the action of gravity alone and its motion is described by $x = 49t - 4.9t^2$. It is at a maximum height when :

A. t = 0

B. t = 5

C. t = 10

D. None of these.

Answer: B

Watch Video Solution

25. The function $f(x) = ax + b$, is strictly decreasing for all $x \in R$ iff :

A. a = 0

B. $a < 0$

C. $a > 0$

D. None of these.

Answer: B

Watch Video Solution

26. Tangents to the curve $y = x^3$ at points (1, 1) and (-1, -1) are :

A. intersecting but not at rt. angles

B. parallel

C. perpendicular

D. None of these.

Answer: C

Watch Video Solution

27. Let f(x) be continuous in a neighbourhood of 'a' and $g(a) \neq 0$ g is continuous at x=a. Let f be a function such that $f'(x) = g(x)(x - a)^2$, then :

A. f is decreasing at a if $g(a) > 0$

B. f is increasing at a if $g(a) > 0$

C. f is increasing at a if $g(a) < 0$

D. None of these.

Answer: B

Watch Video Solution

28. The slope of the tangent to the curve :

$$x = a\sin t, y = a\left(\cos t + \log\tan\frac{t}{2}\right)$$

at the point 't' is :

A. $\tan\frac{t}{2}$

B. cot t

C. tan t

D. None of these.

Answer: B

Watch Video Solution

29. Rolle's Theorem is not applicable to the function :

$f(x) = |x|$ in the interval [-3, 3] because :

A. f is not derivable in (-3, 3)

B. $f(x) \geq 0 \forall$ x in [-3, 3]

C. $f(3) \neq f(-3)$

D. f is continuous in (-3, 3)

Answer: A

Watch Video Solution

30. Rolle's theorem holds for the function $f(x) = x^3 + bx^2 + cx, 1 \leq x \leq 2$ at the point $\frac{4}{3}$, the values of b and c are :

A. b = 8, c = -5

B. b = -5, c = 8

C. b = 5, c = -8

D. b = -5, c = -8

Answer: B

Watch Video Solution

31. There exists a function f(x) satisfying $f(0) = 1, f'(0) = -1, f(x) > 0$, for all x, then :

A. $f''(x) < -2$, for all x

B. $-2 \leq f''(x) \leq -1$, for all x

C. $1 \leq f''(x) < 0$ for all x

D. $f''(x) > 0$, for all x.

Answer: C

Watch Video Solution

32. Let $f(x) = x^3 - 6x^2 + 9x + 18$, then f(x) is strictly decreasing in :

A. (1, 3)

B. $(-\infty, 1] \cup [3, \infty)$

C. $[3, \infty)$

D. $(-\infty, 1]$

Answer: A

Watch Video Solution

33. Let $f(x) = x^4 - 4x$, then :

A. f is increasing in $(-\infty, 1]$

B. f is increasing in $[1, \infty)$

C. f is decreasing in $[1, \infty)$

D. None of these

Answer: B

Watch Video Solution

34. If the graph of a differentiable function y = f(x) meets the lines y = -1 and y = 1, then the graph :

A. does not meet the line y = 0

B. meets the line y = 0 atleast thrice

C. meets the line y = 0 atleast twice

D. meets the line y = 0 at least once.

Answer: D

View Text Solution

35. The equation of the tangent to the curve $y^2 = 4ax$ at the point $(at^2, 2at)$ is :

A. $tx + y = at^3$

B. $ty = x - at^2$

C. $ty = x + at^2$

D. None of these

Answer: C

Watch Video Solution

36. Let $f(x) = \frac{x}{1+x} - \log(1+x)$, when $x > 0$, then f is :

A. a decreasing function

B. neither increasing nor decreasing

C. an increasing function

D. None of these.

Answer: A

Watch Video Solution

37. In case of strictly increasing function, slope of the tangent and hence derivative is :

A. zero

B. either positive or zero

C. negative

D. positive.

Answer: B

Watch Video Solution

38. Let $f(x) = x^3 + \frac{3}{2}x^2 + 3x + 3$, then f(x) is :

A. a decreasing function

B. an increasing function

C. an odd function

D. an even function.

Answer: B

Watch Video Solution

39. Let $f(x) = x - \cos x, x \in R$, then f is :

A. a decreasing function

B. an increasing function

C. an odd function

D. None of these.

Answer: B

Watch Video Solution

40. The acceleration of a moving particle whose space time equation is given by $s = 3t^2 + 2t - 5$ is :

A. 6

B. 5

C. 0

D. 1

Answer: A

Watch Video Solution

41. The normal to a given curve is parallel to x-axis if :

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

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

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

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

Answer: B

Watch Video Solution

42. The equation of the normal at the point 't' to the curve $x = at^2, y = 2at$ is :

A. $tx + y = 2at + at^3$

B. $tx + y = 2at$

C. $tx + y = at^2$

D. None of these.

Answer: A

Watch Video Solution

43. The function $f(x) = \frac{x}{|1 + |x|}$ is :

A. not differentiable at x = 0

B. strictly increasing

C. strictly decreasing

D. neither increasing nor decreasing.

Answer: B

Watch Video Solution

44. The point on the curve $y = x^2$, where slope of the tangent is equal to the x-coordinate of the point is :

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

B. (0, 0)

C. (2, 0)

D. (0, 2)

Answer: B

Watch Video Solution

45. The equation of the horizontal tangent to the curve $y = e^x + e^{-x}$ is :

A. y = -2

B. y = -3

C. y = 2

D. None of these.

Answer: C

Watch Video Solution

46. The points on the curve $y = 12x - x^3$, the tangents at which are parallel to x-axis are :

A. (-2, 16) and (2, -16)

B. (2, 16) and (-2, -16)

C. (2, 16) and (-2, 16)

D. None of these.

Answer: B

Watch Video Solution

47. Let $f(x) = \frac{\log x}{x} + \log 51$, then f(x) is :

A. $f'(x) = 0$ for $x = 2e^3$

B. decreasing for $2 < x < e$

C. increasing for $x > e$

D. decreasing for $x > e$.

Answer: D

Watch Video Solution

48. The function f(x) = tan x for all real

$x \neq \pm \frac{\pi}{2}, \pm \frac{3\pi}{2}, \ldots\ldots..$ is :

A. increasing

B. decreasing

C. neither decreasing nor increasing

D. None of these.

Answer: A

View Text Solution

49. Rolle's theorem is applicable in case of $f(x) = a^{\sin x}$ in :

A. interval $(o, \pi / 2)$

B. any interval

C. interval $(0, \pi)$

D. None of these.

Answer: D

Watch Video Solution

50. The value of k in order that $f(x) = \sin x - \cos x - kx + b$ decrease for all real values is given by :

A. $k < \sqrt{2}$

B. $k \geq \sqrt{2}$

C. $k < 1$

D. $k \geq 1$

Answer: B

Watch Video Solution

51. A particle moves so that the space described in time 't' is square root of a quadratic function of 't', then

A. acc. varies as s^3

B. acc. varies as $\frac{1}{s}$

C. acc. varies as $\frac{1}{s^3}$

D. None of these.

Answer: C

Watch Video Solution

52. Maximum value of $f(x) = \sin x + \cos x$ is :

A. 1

B. 2

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

D. $\sqrt{2}$

Answer: D

Watch Video Solution

53. The function $f(x)=\sum_{k=1}^{5}(x-k)^2$ assumes minimum value for x given by:

A. 5

B. $5/2$

C. 3

D. 2

Answer: C

Watch Video Solution

54. Let x and y be two variables such that $x > 0$ and xy =1. Then the minimum value of x+y is

A. 2

B. -2

C. 1

D. None of these.

Answer: C

Watch Video Solution

55. On uniform heating, the side of a square sheet of metal is increasing at the rate of 0.02 cm/sec. The rate at which the area is increasing when the side is 10 cm long is :

A. $0.4cm^2 / \sec$

B. $0.2cm^2 / \sec$

C. $4.0cm^2 / \sec$

D. $40cm^2 / \sec.$

Answer: A

Watch Video Solution

56. The greatest value of $f(x) = \cos\left(xe^{[x]} + 7x^2 - 3x\right), x \in [-1, \infty)$ is :

A. -1

B. 1

C. 0

D. None of these.

Answer: B

Watch Video Solution

57. The function $f(x) = x + \frac{4}{x}$ has :

A. a local maxima at x = 2 and a local minima at x = -2

B. local minima at x = 2 and a local maxima at x = -2

C. absolute maxima at x = 2 and absolute minima at x = -2

D. absolute minima at x = 2 and absolute maxima at x = -2.

Answer: B

View Text Solution

58. Let $f(x) = (x^2 - 4)^{1/3}$, then f has a :

A. local maxima at x = 0

B. local minima at x = 0

C. point of inflexion at x = 0

D. None of these.

Answer: B

View Text Solution

59. The function $f(x) = 2 + 4x^2 + 6x^4 + 8x^6$ has :

A. only one maxima

B. only one minima

C. no maxima and minima

D. many maxima and minima.

Answer: B

Watch Video Solution

60. The function $f(x) = |x|$ has:

A. only one minima

B. only one maxima

C. no maxima or minima

D. None of these.

Answer: A

Watch Video Solution

61. If $f(x) = x + \frac{1}{x}$, then :

A. relative minimum gt relative maximum

B. relative maximum gt relative minimum

C. relative maximum does not exist

D. relative minimum does not exist.

Answer: A

View Text Solution

62. Let $f(x) = \cos x \sin 2x$, then :

A. min. $f(x) > -\frac{2}{9}$ for $x \in (-\pi, \pi)$

B. min. $f(x) > -\frac{1}{9}$ for $x \in [-\pi, \pi]$

C. min. $f(x) = -\frac{1}{3\sqrt{3}}$ for $x \in [-\pi, \pi]$

D. min. $f(x) > \frac{-9}{7}$ or $\frac{-7}{9}$ for $x \in [-\pi, \pi]$.

Answer: D

Watch Video Solution

63. Let f(x) have second derivative at c such that $f'(c) = 0$ and f''(c) gt 0`, then c is a point of :

A. inflexion

B. local maxima

C. local minima

D. None of these.

Answer: C

Watch Video Solution

64. The function $f(x) = 2x^3 - 3x^2 - 12x + 4$ has :

A. no maxima and minima

B. two maxima

C. two minima

D. one maxima and one minima.

Answer: D

Watch Video Solution

65. A circle of radius unity is inscribed in an isosceles triangle. The least perimeter of the triangle is :

A. $6\sqrt{3}$

B. 9

C. $2\sqrt{3}$

D. $3\sqrt{3}$

Answer: A

Watch Video Solution

66. The greatest value of :

$f(x) = \cos\left[xe^{[x]} + 7x^2 - 3x\right], x \in [-1, \infty)$ is :

A. 0

B. -1

C. 1

D. None of these.

Answer: C

Watch Video Solution

67. If $f'(x) = (x-a)^{2n}(x-b)^{2p+1}$, when n and p are positive integers, then :

A. x = a is a point of maxima

B. x = a is a point of minima

C. x = a is neither a point of maxima nor a point of minima

D. None of these.

Answer: C

Watch Video Solution

68. If $f'(x) = (x-a)^{2n}(x-b)^{2m+1}$, where $m, n \in N$, then :

A. x = b is a point of inflexion

B. x = b is a point of minima

C. x = b is a point of maxima

D. None of these.

Answer: B

View Text Solution

69. The minimum value of $2^{(x^2-3)^3+27}$ is :

A. 2^{27}

B. 2

C. 1

D. None of these.

Answer: C

Watch Video Solution

70. A stone is thrown vertically upwards and the height x ft, reached by the stone in t seconds is given by $x = 80t - 16t^2$. The stone reaches the maximum height in

A. 2

B. 4

C. 3

D. 2.5.

Answer: D

Watch Video Solution

71. A particle moves along x-axis so that its position is given by $x = 2t^3 - 3t^2$ at times t seconds. What is the time interval during which the particle will be on the negative half of the axis ?

A. $0 < t < \frac{2}{3}$

B. $0 < t < 1$

C. $0 < t < 3/2$

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

Answer: C

View Text Solution

View Text Solution

72. The velocity v m/sec of particle is proportional to the cube of the time. If the velocity after 2 secs is 4m/sec, then v is equal to :

A. t^3

B. $\frac{t^3}{2}$

C. $\frac{t^3}{3}$

D. $\frac{t^3}{4}$

Answer: B

Watch Video Solution

73. Maximum slope of the curve $y = -x^3 + 3x^2 + 9x - 27$ is :

A. 0

B. 12

C. 16

D. 32

Answer: B

Watch Video Solution

74. Let $f(x) = 2x^3 - 3x^2 - 12x + 5$ on [-2, 4]. The relative maxima occurs at x =

A. -2

B. -1

C. 2

D. 4

Answer: D

Watch Video Solution

75. The function which is neither decreasing nor increasing in $(\pi/2, 3\pi/2)$, is :

A. cos x

B. tan x

C. x^2

D. $|x-1|$

Answer: A

Watch Video Solution

76. The maximum value of $f(x) = \frac{x}{1+4x+x^2}$ on [-1, 1] is :

A. $-\frac{1}{4}$

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

C. $\frac{1}{6}$

D. $\frac{1}{5}$

Answer: C

Watch Video Solution

77. The abscissae of the points of the curve $y = x(x-2)(x-4)$, where tangents are parallel to x-axis, is obtained as :

A. $x = 2 \pm \frac{2}{\sqrt{3}}$

B. $x = 1 \pm \frac{1}{\sqrt{3}}$

C. $x = 2 \pm \frac{1}{\sqrt{3}}$

D. $x = \pm 1$

Answer: A

Watch Video Solution

78. Let $f(x) = [e^x(x-1)(x-2)]$. Then f decrease in the interval :

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

B. $(-2, -1)$

C. $(1, 2)$

D. $(2, +\infty)$

Answer: C

Watch Video Solution

79. For all $x \in (0, 1)$:

A. $e^x < 1 + x$

B. $\log(1 + x) < x$

C. $\sin x > x$

D. $\log_e x > x$

Answer: B

Watch Video Solution

80. The function $f(x) = \cot^{-1} x + x$ increases in the interval :

A. $(1, \infty)$

B. $(-1, \infty)$

C. $(-\infty, \infty)$

D. $(0, \infty)$

Answer: C

Watch Video Solution

81. The real number x when added to its inverse gives the minimum value of the sum at x equal to :

A. 1

B. -1

C. -2

D. 2

Answer: A

Watch Video Solution

82. Find which function does nto obey Mean Value Theorem in [0, 1] :

A. $f(x) = \begin{cases} \frac{1}{2} - x, x < \frac{1}{2} \\ \left(\frac{1}{2} - x\right)^2, x \geq \frac{1}{2} \end{cases}$

B. $f(x) = \begin{cases} \frac{\sin x}{x}, x \neq 0 \\ 1, x = 0 \end{cases}$

C. $f(x) = x|x|$

D. $f(x) = |x|$

Answer: A

Watch Video Solution

83. A point an the parabola $y^2 = 18x$ at which the ordinate increases at twice the rate of the abscissa is :

A. (2, 4)

B. (2, -4)

C. $\left(-\frac{9}{8}, \frac{9}{2}\right)$

D. $\left(\frac{9}{8}, \frac{9}{2}\right)$

Answer: D

Watch Video Solution

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

A. (a, 0)

B. (0, a)

C. (0, 0)

D. (a, a)

Answer: A

Watch Video Solution

85. A function y = f(x) has a second order derivative $f''(x) = 6(x - 1)$. If its graph passes thro' the point (2, 1) and at the point the tangent to the graph is $y = 3x - 5$, then the function is :

A. $(x + 1)^3$

B. $(x - 1)^3$

C. $(x - 1)^2$

D. $(x + 1)^2$

Answer: B

Watch Video Solution

86. If $f(x) = x^3 + bx^2 + cx + d$ and $0 < b^2 < c$, then in $(-\infty, \infty)$, $f(x)$:

A. is increasing

B. has real maximum

C. is decreasing

D. is bounded.

Answer: A

Watch Video Solution

87. If $f(x) = x^{\alpha} \log x$ and $f(0) = 0$, then the value of α for which Roll's theorem can be applied in [0, 1] is :

A. -2

B. -1

C. 0

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

Answer: D

Watch Video Solution

88. If f(x) is differentiable increasing function, then $\lim_{x \to 0} \frac{f(x^2) - f(x)}{f(x) - f(0)}$ equals :

A. 1

B. 0

C. -1

D. 2

Answer: C

Watch Video Solution

89. The normal to the curve :

$x = a(\cos\theta + \theta\sin\theta), y = a(\sin\theta - \theta\cos\theta)$

at any point $'\theta'$ is such that:

A. it makes angle $\frac{\pi}{2} + \theta$ with the x-axis

B. it passes through the origin

C. it is at a constant distance from the origin

D. it passes through $\left(\frac{a\pi}{2}, -a\right)$

Answer: A

Watch Video Solution

90. A function is matched below against an interval where it is supposed to be increasing. Which of the following parts is incorrectly matched?

A. Interval: $[2, \infty)$ Function: $2x^3 - 3x^2 - 12x + 6$

B. Interval: $(-\infty, \infty)$ Function: $x^3 - 3x^2 + 3x + 3$

C. Interval: $(-\infty, -4]$ Function: $x^3 + 6x^2 + 6$

D. Interval: $\left(-\infty, \frac{1}{3}\right]$ Function: $3x^3 - 2x + 1$

Answer: D

Watch Video Solution

91. Let f be differentiable for all x. If $f(1) = -2, f'(x) \geq 2$ for all $x \in [1, 6]$, then :

A. $f(6) < 8$

B. $f(6) \geq 8$

C. $f(6) = 5$

D. $f(6) = 5$

Answer: B

Watch Video Solution

92. The function $f(x) = \frac{x}{2} + \frac{2}{x}$ has a local minimum at :

A. x = 2

B. x = -2

C. x = 0

D. x = 1

Answer: A

Watch Video Solution

93. Angle between the tangents to the curve $y = x^2 - 5x + 6$ at the points (2, 0) and (3, 0) is :

A. $\pi / 2$

B. $\pi / 3$

C. $\pi / 6$

D. $\pi / 4$

Answer: A

Watch Video Solution

94. The function $f(x) = \tan^{-1}(\sin x + \cos x)$ is an increasing function in :

A. $\left(-\frac{\pi}{2}, \frac{\pi}{4}\right)$

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

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

D. $\left(\frac{\pi}{4}, \frac{\pi}{2}\right)$

Answer: A

Watch Video Solution

95. A value of c for which the conclusion of Mean Value Theorem holds for the function $f(x) = \log_e x$ on the interval [1, 3] is :

A. $\frac{1}{2}\log_e^3$

B. $\log_3 e$

C. $\log_e^3$

D. $2\log_3 e$

Answer: D

Watch Video Solution

Multiple Choice Questions Level Ii

1. Let f(x) satisfy the requirements of Largrange's Mean Value Theorem in [0, 2]. If f(0) = 0 and $|f'(x)| \leq \frac{1}{2}$, for all x in [0, 2], then :

A. $f(x) \leq 2$

B. $|f(x)| \leq 1$

C. $f(x) = 2x$

D. $f(x) = 3$, for at least one x in [0, 2]

Answer: B

Watch Video Solution

2. AB is a diameter of a circle and C is any point on the circumference of the circle, then :

A. the area of ΔABC is max. when it is isosceles

B. the area of ΔABC is minimum when it is isosceles

C. the perimeter of ABC is minimum when it is isosceles

D. None of these.

Answer: A

Watch Video Solution

3. Two towns A and B are 60 km apart. A school is to be built to serve 150 students in town A and 50 students in town B. If the total distance to be travelled by all 200 students is to be as small as possible, then the school should be built at :

A. town B

B. 45 km from town A

C. town A

D. 45 km from town B

Answer: C

Watch Video Solution

4. Let f(x) be a quadratic expression, which is positive for all real x. If $g(x) = f(x) + f'(x) + f''(x)$, then for any real x :

A. $g(x) < 0$

B. $g(x) > 0$

C. $g(x) \leq 0$

D. $g(x) \geq 0$

Answer: B

Watch Video Solution

5. The normal to the curve :

$x = a(\cos\theta + \theta\sin\theta), y = a(\sin\theta - \theta\cos\theta)$

at any point $'\theta'$ is such that:

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

Watch Video Solution

6. The line $\frac{x}{a} + \frac{y}{b} = 1$ touches the curves $y = be^{-x/a}$ at the point :

A. $(a, b/a)$

B. $(-a, ba)$

C. $(a, a/b)$

D. None of these.

Answer: D

Watch Video Solution

7. The curves $y = x^2$ and $6y = 7 - x^3$ intersect at the point (1, 1) at an angle :

A. $\pi / 4$

B. $\pi / 3$

C. $\pi / 2$

D. None of these.

Answer: C

Watch Video Solution

8. 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. for x = 3

B. for x = 2

C. for any value of n

D. for no value of n.

Answer: C

Watch Video Solution

9. Let f(x) and g(x) be differentiable for $0 \leq x \leq 1$ such that $f(0) = 0$, $g(0) = 0$, $f(1) = 6$. Let there exist a real number c in (0, 1) such that $f'(c) = 2g'(c)$, then the value of g(1) must be :

A. 1

B. 3

C. -2

D. -1

Answer: B

Watch Video Solution

10. A cannon ball is fired at an angle $\theta, 0 < \theta < \pi/2$, with the horizontal. If v is the initial velocity of the cannon ball, the height h of the ball at time t, ignoring the air resistance, is given by :

$h = (v \sin \theta)t - 4.9t^2$.

The value of θ so that the horizontal range of the ball is maximum is :

A. $\pi / 6$

B. $\pi / 6$

C. $\pi / 3$

D. $3\pi / 4$

Answer: B

View Text Solution

11. The area of the triangle formed by the co-ordinate axes and a tangent to the curve $xy = a^2$ at the point (x_1, y_1) on it is :

A. $\frac{a^2 x_1}{y_1}$

B. $\frac{a^2 y_1}{x_1}$

C. $2a^2$

D. $4a^2$

Answer: C

Watch Video Solution

12. If $a+b+c=0$, then the equation $3ax^2+2bx+c=0$ has :

A. at least one real root in (0, 1)

B. one root is (-1, 0) and other in (1, 2)

C. both imaginary roots

D. two coincident roots.

Answer: A

Watch Video Solution

13. Let f(x) be twice differentiable on [1, 3], and let $f(1) = f(3)$.

Further if $|f''(x)| \leq 2$, then for all x in [1, 3] :

A. $-1 \leq f'(x) \leq 1$

B. $-4 < f'(x) < 4$

C. $|f'(x)| > 2$

D. $|f'(x)| < 4$

Answer: D

View Text Solution

14. Let f be a real valued function defined on $(0, 1) \cup (2, 4)$, such that $f(x) = 0$, for every x, then :

A. f is a constant function if $f\left(\frac{1}{2}\right) = 0$

B. f is not a constant function

C. f is a constant function $f(1/2) = f(3)$

D. f is a constant function.

Answer: C

Watch Video Solution

15. If $x \in (0, \pi/2)$, then :

A. $\tan x < x < \sin x$

B. $x < \sin x < \tan x$

C. $\sin x < x < \tan x$

D. None of these.

Answer: C

View Text Solution

16. The curve $y = ax^3 + bx^2 + cx$ is inclined at 45° to X-axis at (0, 0), but it touches X-axis at (1, 0), then the values of a, b, c are given by:

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

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

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

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

Answer: B

Watch Video Solution

17. If $\log_{0.3}(x-1) < \log_{0.09}(x-1)$, then x lies in the interval :

A. (-2, -1)

B. (1, 2)

C. $(2, \infty)$

D. None of these.

Answer: C

Watch Video Solution

18. The angle of intersection of the two curves $xy = a^2$ and $x^2 - y^2 = 2b^2$ is :

A. $\pi / 3$

B. $\pi / 6$

C. $\pi / 4$

D. None of these.

Answer: D

Watch Video Solution

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

A. $3/5$

B. 3

C. $5/3$

D. 15

Answer: D

Watch Video Solution

20. The equation $3x^2 + 4ax + b = 0$ has atleast one root in (0, 1) if :

A. $b = 0, a = -4/3$

B. $4a + b + 3 = 0$

C. $2a + b + 1 = 0$

D. None of these.

Answer: C

Watch Video Solution

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

A. (1, 0)

B. (0, 0)

C. (1, 1)

D. at no point

Answer: A

Watch Video Solution

22. If the normal to the curve y = f(x) at the point (3, 4) makes an angle $3\pi / 4$ with the positive x-axis, then $f'(3)$ is :

A. -1

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

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

D. 1

Answer: D

Watch Video Solution

23. If $x + y = k$ is normal to $y^2 = 12x$, then k is :

A. 3

B. 9

C. -9

D. -3

Answer: B

Watch Video Solution

24. The 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 $\frac{\pi}{3}$

D. cut at an angle $\frac{\pi}{4}$

Answer: A

Watch Video Solution

25. The greatest distance of the point P(10, 7) form the circle $x^2 + y^2 - 4x - 2y - 20 = 0$ is :

A. 10

B. 15

C. 5

D. None of these.

Answer: B

Watch Video Solution

26. The greatest value of $f(x) = (x+1)^{1/3} - (x-1)^{1/3}$ on [0, 1] is :

A. 1

B. 2

C. 3

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

Answer: B

Watch Video Solution

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

Answer: D

Watch Video Solution

28. If the function $f(x) = 2x^3 - 9ax^2 + 12a^2x + 1$, where $a > 0$ attains its maximum and minimum at p and q respectively such their $p^2 = q$, then a equals :

A. 1

B. 2

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

D. 3

Answer: B

Watch Video Solution

29. If minimum value of $f(x) = x^2 + 2bx + 2c^2$ is greater than maximum value of $g(x) = -x^2 - 2cx + b^2$, then for x is real :

A. $|c| > |b|\sqrt{2}$

B. $|c|\sqrt{2} > b$

C. $0 < c < \sqrt{2}b$

D. no real value of a.

Answer: A

Watch Video Solution

30. The line $2x + \sqrt{6}y = 2$ is a tangent to the curve $x^2 - 2y^2 = 4$. The point of contact is :

A. $(4, -\sqrt{6})$

B. $(7, -2\sqrt{6})$

C. $(2, 3)$

D. $(\sqrt{6}, 1)$

Answer: A

Watch Video Solution

31. A spherical iron ball 10 cm in radius is coated with a layer of ice of uniform thickness that melts at a rate of $50cm^3$ / min. When the thickness of ice is 5 cm, then the rate at which the thickness of ice decreases, is :

A. $\frac{1}{18\pi}$ cm/min

B. $\frac{1}{36\pi}$ cm/min

C. $\frac{5}{6\pi}$ cm/min

D. $\frac{1}{54\pi}$ cm/min

Answer: A

Watch Video Solution

32. Suppose the cubic $x^3 - px + q$ has three distinct real roots, where $p > 0$ and $q > 0$. Then which one of the following holds ?

A. The cubic has maxima at both $\sqrt{\frac{p}{3}}$ and $-\sqrt{\frac{p}{3}}$

B. The cubic has minima at $\sqrt{\frac{p}{3}}$ and maxima at $-\sqrt{\frac{p}{3}}$

C. The cubic has minima at $-\sqrt{\frac{p}{3}}$ and maxima at $\sqrt{\frac{p}{3}}$

D. The cubic has minima at both $\sqrt{\frac{p}{3}}$ and $-\sqrt{\frac{p}{3}}$.

Answer: B

Watch Video Solution

33. The total number of local maxima and local minima of the function :

$$f(x) = \begin{cases} (2+x)^3, & -3 < x \leq -1 \\ x^{\frac{2}{3}}, & -1 < x < 2 \end{cases}$$ is :

A. 0

B. 1

C. 2

D. 3

Answer: C

Watch Video Solution

34. Let the function $g:(-\infty, \infty) \rightarrow \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ be given by $g(u) = 2\tan^{-1}(e^u) - \frac{\pi}{2}$. Then g is :

A. even and is strictly increasing in $(0, \infty)$

B. odd and is strictly decreasing in $(-\infty, \infty)$

C. odd and is strictly increasing in $(-\infty, \infty)$

D. neither even nor odd, but is strictly increasing in $(-\infty, \infty)$

Answer: C

Watch Video Solution

35. Given $P(x) = x^4 + ax^3 + \; + bx^2 + cx + d$ such that $x = 0$ is the only real root of $p''(x) = 0$. If $P(-1) < P(1)$, then in the interval [-1, 1] :

A. P(-1) is the minimum and P(1) is the maximum of P

B. P(-1) is not the minimum and P(1) is the maximum of P

C. P(-1) is the minimum but P(1) is not the maximum of P

D. neither $P(-1)$ is the minimum nor P(1) is the maximum of P.

Answer: B

View Text Solution

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

A. y = 0

B. y = 1

C. y = 2

D. y = 3

Answer: D

Watch Video Solution

2. Let $f: R \rightarrow R$ be a positive increasing function with $\lim_{x \rightarrow \infty} \frac{f(3x)}{f(x)} = 1$. Then $\lim_{x \rightarrow \infty} \frac{f(2x)}{f(x)} =$

A. 1

B. $\frac{2}{3}$

C. $\frac{3}{2}$

D. 3

Answer: A

Watch Video Solution

3. Let $f: R \to R$ be defined by :

$$f(x) = \begin{cases} k - 2x, & \text{if } x \le -1 \\ 2x + 3, & \text{if } x > -1 \end{cases}.$$

If f has a local maximum at x = -1, then a possible value of k is :

A. 1

B. 0

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

D. -1

Answer: D

Watch Video Solution

4. Let f, g and h be real-valued functions defined on the interval [0, 1] by:

$f(x) = e^{x^2} + e^{-x^2}$, $g(x) = xe^{x^2} + e^{-x^2}$ and $h(x) = x^2e^{x^2} + e^{-x^2}$

.

If a, b and c denote respectively the absolute maximum of f, g and h on [0, 1], then :

A. $a = b$ and $c \neq b$

B. $a = c$ and $a \neq b$

C. $a \neq b$ and $c \neq b$

D. $a = b = c.$

Answer: D

Watch Video Solution

5. The shortest distance between $y - x = 1$ and curve $x = y^2$ is

:

A. $\frac{\sqrt{3}}{4}$

B. $\frac{3\sqrt{2}}{8}$

C. $\frac{8}{3\sqrt{2}}$

D. $\frac{4}{\sqrt{3}}$

Answer: B

Watch Video Solution

6. The shortest distance between $y - x = 1$ and curve $x = y^2$ is

:

A. $\frac{3\sqrt{2}}{8}$

B. $\frac{2\sqrt{3}}{8}$

C. $\frac{3\sqrt{2}}{5}$

D. $\frac{\sqrt{3}}{4}$

Answer: A

Watch Video Solution

7. A spherical balloon is filled with 4500π cubic metres of helium gas. If a leak in the balloon causes the gas to escape at the rate of 72π cubic metres per minute, then the rate (in metres per minute) at which the radius of the balloon decreases 49 minutes after the leakage begins is :

A. $\frac{9}{7}$

B. $\frac{7}{9}$

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

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

Answer: C

Watch Video Solution

8. The real number k for which the equation :

$2x^3 + 3x + k = 0$ has two distinct real roots in [0, 1] :

A. lies between 2 and 3

B. lies between -1 and 0

C. does not exist

D. lies between 1 and 2.

Answer: C

Watch Video Solution

9. The number of points in $(-\infty, \infty)$, for which $x^2 - x\sin x - \cos x = 0$, is :

A. 6

B. 4

C. 2

D. 0

Answer: C

Watch Video Solution

Watch Video Solution

10. If f and g are differentiable functions in [0, 1] satisfying $f(0) = 2 = g(1), g(0) = 0$ and $f(1) = 6,$ then for some $c \in [0, 1]$:

A. $2f'(c) = 3g'(c)$

B. $f'(c) = g'(c)$

C. $f'(c) = 2g'(c)$

D. $2f'(c) = g'(c)$

Answer: C

Watch Video Solution

11. If x = -1 and x = 2 are extreme points of :

$f(x) = \alpha \log|x| + \beta x^2 + x$, then :

A. $\alpha = -6, \beta = -\frac{1}{2}$

B. $\alpha = 2, \beta = -\frac{1}{2}$

C. $\alpha = 2, \beta = \frac{1}{2}$

D. $\alpha = -6, \beta = \frac{1}{2}$

Answer: B

Watch Video Solution

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

A. does not meet the curve again

B. meets the curve again in the second quadrant

C. meets the curve again in the third quadrant

D. meets the curve again in the fourth quadrant.

Answer: D

Watch Video Solution

13. Let f(x) be a polynomial of degree four having extreme values at x = 1 and x = 2. If $\lim_{x \to 0}\left[1+\frac{f(x)}{x^2}\right]=3$, then f(2) is equal to :

A. -8

B. -4

C. 0

D. 4

Answer: C

Watch Video Solution

Recent Competitive Questions Questions From Karnataka Cet Comed

1. P is the point of contact of the tangent from the orign to the curve $y = \log_e^x$. the length of the perpendicular drawn from the origin to the normal at P is

A. $\sqrt{e^2 + 1}$

B. $2\sqrt{e^2 + 1}$

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

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

Answer: A

Watch Video Solution

2. For the curve $4x^5 = 5y^4$, the ratio of the cube of the sub-tangent at a point on the curve to the square of the sub-normal at the same point is :

A. $\left(\frac{5}{4}\right)^4$

B. $\left(\frac{4}{5}\right)^4$

C. $y\left(\frac{5}{4}\right)^4$

D. $x\left(\frac{4}{5}\right)^5$

Answer: B

Watch Video Solution

3. The set of real values of x for which $f(x) = \frac{x}{\log x}$ is increasing is :

A. {1}

B. $\{x : x < e\}$

C. empty

D. $\{x : x \geq e\}$

Answer: D

Watch Video Solution

4. A wire of lenggth 20 cm is bent in the form of a sector of a circle. The maximum area that can be snclosed by the wire is

A. 30 sq. cm

B. 10 sq. cm

C. 25 sq. cm

D. 20 sq. cm

Answer: C

Watch Video Solution

5. If for the curve $y = 1 + bx - x^2$ the tangent at (1, -2) is parallel to x-axis, then b =

A. 2

B. -2

C. 1

D. -1

Answer: D

Watch Video Solution

6. The slopes of the tangent and normal at (0, 1) for the curve $y = \sin x + e^x$ are respectively :

A. 1 and -1

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

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

D. -1 and 1

Answer: C

Watch Video Solution

7. A stone is thrown vertically upwards and the height x ft, reached by the stone in t seconds is given by $x = 80t - 16t^2$.

The stone reaches the maximum height in

A. 2 secs

B. 2.5 secs

C. 3 secs

D. 3.5 secs.

Answer: B

Watch Video Solution

8. If $\sin^{-1}$ a is the acture angle between the curves $x^2 + y^2 = 4x$ and $x^2 + y^2 = 8$ at (2,2), then a=

A. 1

B. 0

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

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

Answer: C

Watch Video Solution

9. The maximum area of rectangle that can be inscribed in a circle of radius 2 units is :

A. 8π sq. units

B. 4 sq. units

C. 5 sq. units

D. 8 sq. units

Answer: D

Watch Video Solution

10. A stone is dropped into a quiet lake and waves in circles at the speed of 5 cm/s. At the instant when the radius of the circular wave is 8 cm, how fast is the enclosed area increasing?

A. $8x cm^2 / s$

B. $80\pi cm^2 / s$

C. $6\pi cm^2 / s$

D. $\frac{8}{3} cm^2 / s$

Answer: B

Watch Video Solution

11. A gardener is digging a plot of land. As he gets tired, he works more slowly, After 't' minutes he is digging at a rate of $\frac{2}{\sqrt{t}}$

square metres per minute. How long will it take him to dig an area of 40 square metres ?

A. 10 minutes

B. 40 minutes

C. 100 minutes

D. 30 minutes.

Answer: C

Watch Video Solution

12. If $f(x) = x^3$ and $g(x) = x^3 - 4x$ in $-2 < x < 2,$ then consider the statements :

(a) f(x) and g(x) satisfy Mean Value Theorem

(b) f(x) and g(x) both satisfy Rolle's theorem (c) Only g(x) satisfies Rolle's theorem.

OF THE STATEMENTS

A. (a) alone is correct

B. (a) and (c) are correct

C. (a) and (b) are correct

D. None is correct.

Answer: B

Watch Video Solution

13. The tangent to the curve $y = x^3 + 1$ at(1, 2) makes an angle θ with y-axis, then the value of tan θ is

A. 3

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

C. $-\frac{1}{3}$

D. -3

Answer: B

Watch Video Solution

14. The maximum value of $\left(\frac{1}{x}\right)^{2x^2}$ is :

A. $e^{1/2}$

B. $(e)^{1/e}$

C. 1

D. e^2

Answer: B

Watch Video Solution

15. Let x be a number which exceeds its square by the greatest possible quantity, then x =

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

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

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

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

Answer: A

Watch Video Solution

16. The sub tangent at $x=\frac{\pi}{2}$ on the curve $y=\sin x$ is :

A. 0

B. 1

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

D. None of these.

Answer: A

Watch Video Solution

17. A balloon which always remains spherical is being inflated by pumping in 10 cubic centrimeters of gas per second . Find the rate at which the radius 15 cm .

A. $\frac{1}{90\pi}$ cm/sec

B. $\frac{1}{9\pi}$ cm/sec

C. $\frac{1}{30\pi}$ cm/sec

D. $\frac{1}{\pi}$ cm/sec.

Answer: A

Watch Video Solution

18. The two curves $x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 = 2$

A. touch each other

B. cut at right-angle

C. cut at an angle $\frac{\pi}{3}$

D. cut at an angle $\frac{\pi}{4}$

Answer: B

Watch Video Solution

19. If x is real, the minimum value of $x^2 - 8x + 17$ is :

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

20. The slant height of a cone is fixed at 7 cm. If the rate of increase of its height is 0.3 cm/sec., then the rate of increase of its volume when its height is 4 cm is :

A. $\frac{\pi}{2}$ cm/sec.

B. π cm/sec.

C. $\frac{\pi}{5}$ cm/sec.

D. $\frac{\pi}{10}$ cm/sec.

Answer: D

Watch Video Solution

21. If $S^2 = at^2 + 2bt + c$, then the acceleration is :

A. Directly proportional to S

B. Inversely proportional to S

C. Directly proportional to S^2

D. Inversely proportional to S^3.

Answer: D

Watch Video Solution

22. The value of 'c' in Lagrange's Theorem for the function $f(x) = \log(\sin x)$ in the interval $\left[\frac{\pi}{6}, \frac{5\pi}{6}\right]$ is :

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

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

C. $\frac{2\pi}{3}$

D. None of these.

Answer: B

Watch Video Solution

23. A ladder 5 m long is leaning against a well. The bottom of the ladder is pulled along the ground, away from the well, at the rate of 2 m/s. How fat is its height on the wall decreasing when the foot of the ladder is 4m away from the wall?

A. $\frac{3}{8}$ m/sec.

B. $\frac{8}{3}$ m/sec.

C. $\frac{5}{3}$ m/sec.

D. $\frac{2}{3}$ m/sec.

Answer: B

Watch Video Solution

24. The angle between the curves :

$y^2 = 4ax$ and $ay = 2x^2$ is :

A. $\tan^{-1}\frac{3}{4}$

B. $\tan^{-1}\frac{3}{5}$

C. $\tan^{-1}\frac{4}{3}$

D. $\tan^{-1}\frac{5}{3}$.

Answer: B

Watch Video Solution

25. The maximum area in square units of an isosceles triangle inscribed in an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with its vertex at one end of the major axis is :

A. $\sqrt{3}ab$

B. $\frac{3\sqrt{3}}{4}ab$

C. $\frac{5\sqrt{3}}{4}ab$

D. None of these.

Answer: B

Watch Video Solution