

Q1. Which of the following statements is true for the function $f(x) = \begin{cases} x+3, & x \neq 0 \\ 1, & x = 0 \end{cases}$? **1 Mark**

- A** $f(x)$ is continuous and differentiable $\forall x \in \mathbb{R}$
C $f(x)$ is continuous and differentiable $\forall x \in \mathbb{R} - (0)$

- B** $f(x)$ is continuous $\forall x \in \mathbb{R}$
D $f(x)$ is discontinuous at infinitely many points

Q2. $\int x^2 e^{x^3} dx$ equals: **1 Mark**

- A** $\frac{1}{3}e^{x^3} + C$
C $\frac{1}{2}e^{x^3} + C$

- B** $\frac{1}{3}e^{x^4} + C$
D $\frac{1}{2}e^{x^2} + C$

Q3. The value of k so that f defined by $f(x) = \begin{cases} x^2 \sin\left(\frac{1}{x}\right) & \text{if } x \neq 0 \\ k & \text{if } x = 0 \end{cases}$ is continuous at $x = 0$ is **1 Mark**

- A** 0

- C** 1

- D** 2

Q4. $\int \frac{1+\tan x}{1-\tan x} dx$ is equal to: **1 Mark**

- A** $\sec^2\left(\frac{\pi}{4} + x\right) + C$
C $\log|\sec\left(\frac{\pi}{4} + x\right)| + C$

- B** $\sec^2\left(\frac{\pi}{4} - x\right) + C$
D $\log|\sec\left(\frac{\pi}{4} - x\right)| + C$

Q5. If $x = 2$ at, $y = at^2$, where a is a constant, then $\frac{d^2y}{dx^2}$ at $x = \frac{1}{2}$ is: **1 Mark**

- A** $\frac{1}{2}a$

- B** 1

- C** 2a

- D** None of these

Q6. The least and greatest value of $f(x) = x^3 - 6x^2 + 9x$ in $[0, 6]$, are. **1 Mark**

- A** 3, 4

- B** 0, 4

- C** 0, 3

- D** 3, 6

Q7. If $\sin(x+y) = \log(x+y)$, then $\frac{dy}{dx} =$ **1 Mark**

- A** 2

- B** -2

- C** 1

- D** -1

Q8. $f(x) = \sin x + \sqrt{3} \cos x$ is maximum when $x =$ **1 Mark**

- A** $\frac{\pi}{3}$

- B** $\frac{\pi}{4}$

- C** $\frac{\pi}{6}$

- D** 0

Q9. If $y = a \sin mx + b \cos mx$, then $\frac{d^2y}{dx^2}$ is equal to: **1 Mark**

- A** $-m^2y$

- B** m^2y

- C** $-my$

- D** my

Q10. If $y = \sqrt{\sin x + y}$, then $\frac{dy}{dx}$ equals: **1 Mark**

- A** $\frac{\cos x}{2y-1}$

- C** $\frac{\sin x}{1-2y}$

- B** $\frac{\cos x}{1-2y}$

- D** $\frac{\sin x}{2y-1}$

Q11. If the product of two positive numbers is 9, find the numbers so that the sum of their squares is minimum. **2 Marks**

Q12. The volume of a cube is increasing at the rate of $9 \text{ cm}^3/\text{s}$. How fast is its surface area increasing when the length of an edge is 10 cm? **2 Marks**

Q13. Find: $\int \sin x \cdot \log \cos x dx$. **2 Marks**

Q14. Evaluate: $\int \frac{2x \cdot \tan^{-1}(x^2)}{1+x^4} dx$. **3 Marks**

Q15. If $y = (\tan x)^x$, then find $\frac{dy}{dx}$. 3 Marks

Q16. If $x^{16}y^9 = (x + y)^{17}$, prove that $x \frac{dy}{dx} = 2y$ 5 Marks

Q17. Find the intervals on which the function $f(x) = (x - 1)^3 (x - 2)^2$ is: 5 Marks

1. Strictly increasing.
2. Strictly decreasing.

Q18. Logarithmic differentiation is a powerful technique to differentiate functions of the form $f(x) = [u(x)]^{v(x)}$, where both $u(x)$ and $v(x)$ are differentiable functions and f and u need to be positive functions. 5 Marks

Let function $y = f(x) = (u(x))^{v(x)}$, then $y' = y \left[\frac{v'(x)}{u(x)} u'(x) + v'(x) \cdot \log[u(x)] \right]$

On the basis of above information, answer the following questions.

1. Differentiate x^x w.r.t. x .
1. $x^x(1 + \log x)$
2. $x^x(1 - \log x)$
3. $-x^x(1 + \log x)$
4. $x^x \log x$

2. Differentiate $x^x + a^x + x^a + a^a$ w.r.t. x .

1. $(1 + \log x) + (a^x \log a + a x^{a-1})$
2. $x^x(1 + \log x) + \log a + a x^{a-1}$
3. $x^x(1 + \log x) + x^a \log x + a x^{a-1}$
4. $x^x(1 + \log x) + a^x \log a + a x^{a-1}$

3. If $x = e^{\frac{x}{y}}$, then find $\frac{dy}{dx}$.

1. $-\frac{(x+y)}{x \log x}$
2. $-\frac{(x-y)}{x \log x}$
3. $\frac{(x+y)}{x \log x}$
4. $\frac{x-y}{x \log x}$

4. If $y = (2 - x)^3(3 + 2x)^5$, then find $\frac{dy}{dx}$.

1. $(2 - x)^3(3 + 2x)^5 \left[\frac{15}{3+2x} - \frac{8}{2-x} \right]$
2. $(2 - x)^3(3 + 2x)^5 \left[\frac{15}{3+2x} + \frac{3}{2-x} \right]$
3. $(2 - x)^3(3 + 2x)^5 \left[\frac{10}{3+2x} - \frac{3}{2-x} \right]$
4. $(2 - x)^3(3 + 2x)^5 \cdot \left[\frac{10}{3+2x} + \frac{3}{2-x} \right]$

5. If $y = x^x \cdot e^{(2x+5)}$, then find $\frac{dy}{dx}$.

1. $x^x e^{2x+5}$
2. $x^x e^{2x+5} (3 - \log x)$
3. $x^x e^{2x+5} (1 - \log x)$
4. $x^x e^{2x+5} \cdot (3 + \log x)$

Q19. An architecture design a auditorium for a school for its cultural activities. The floor of the auditorium is rectangular in shape and has a fixed perimeter P . 4 Marks



Based on the above information, answer the following questions.

1. If x and y represents the length and breadth of the rectangular region, then relation between the variable is.
 1. $x + y = P$
 2. $x^2 + y^2 = P^2$
 3. $2(x + y) = P$
 4. $x + 2y = P$
2. The area (A) of the rectangular region, as a function of x , can be expressed as.

**WHATSAPP TEST GROUP FEES
FROM JULY 1 TO TILL FINAL EXAM
WITH PDF ANSWERS**

CBSE 12 RS.2500

CBSE 11 RS.2000

CBSE 10 RS.2500

CBSE 9 RS.1500

OR MONTHLY FEES RS.500

WHATSAPP - 8056206308

CHECK MY WEBSITES FOR FREE PAPERS

www.ravitestpapers.com

www.ravitestpapers.in

1. $A = px + \frac{x}{2}$
2. $A = \frac{px+x^2}{2}$
3. $A = \frac{px-2x^2}{2}$
4. $A = \frac{x^2}{2} + px^2$

3. School's manager is interested in maximising the area of floor 'A' for this to be happen, the value of x should be.

1. P
2. $\frac{P}{2}$
3. $\frac{P}{3}$
4. $\frac{P}{4}$

4. The value of y, for which the area of floor is maximum, is.

1. $\frac{P}{2}$
2. $\frac{P}{3}$
3. $\frac{P}{4}$
4. $\frac{P}{16}$

5. Maximum area of floor is.

1. $\frac{P^2}{16}$
2. $\frac{P^2}{64}$
3. $\frac{P^2}{4}$
4. $\frac{P^2}{28}$

NEED HELP WITH MATHS?

RAVI MATHS TUITION CENTER, CHENNAI - 82

CHECK LOCATION ON GOOGLE MAP

CENTER TUITION AVAILABLE WEEKLY 3 DAYS ONLY

WED SAT SUNDAY 5.30PM TO 9.30PM

FEES MONTHLY BASED



CLASS 8 9 10 11 12

WITH SKILLED AND QUALIFIED TUTORS

MY WEBSITES www.ravitestpapers.com & www.ravitestpapers.in

**RS.750
P/HOUR**

**1 TO 1 HOME AND ONLINE
TUTORING FEES**

WE OFFER INDIVIDUAL 1 TO 1 SESSIONS OF TEACHING TO
YOUR LEARNING STYLE AND PREFERENCE TIME

HOME TUITION AVAILABLE ONLY IN CHENNAI
1 TO 1 ONLINE CLASS AVAILABLE ANY TIME

VISIT MY WEBSITE / YOUTUBE - RAVI TEST PAPERS

WHATSAPP / CALL - 8056206308