RAMA STUDY CENTRE - WHATSAPP - 8754834604

XII - STANDARD - MATHEMATICS

CHAPTER - 7 [IMPORTANT QUESTIONS]

If you need answer means cost Rs. 25/-

1) A person learnt 100 words for an english test. The number of words the person remembers in t days after leaving is given by $W(t) = 100 \times (1-0.1t)^2, 0 \le t \le 10$. What is the rate at which the person forgets the words 2 days after learning?

2) If we blow air into a ballon of spherical shape at a rate of $1000\ cm^3$ per second, at what rate the radius of the baloon changes when the radius is 7cm? Also compute the rate at which the surface area changes

3) Salt is poured from a conveyer belt at a rate of 30 cubic metre per minute forming a conical pile with a circular base whose height and diameter of base are always equal. How fast is the height of the pile increasing when the pile is 10 metre high?

4) A conical water tank with vertex down of 12 meters height has a radius of 5 meters at the top. If water flows into the tank at a rate 10 cubic m/min, how fast is the depth of the water increases when the water is 8m deep?

5) Find the points on the curve $y = x^3 - 3x^2 + x - 2$ at which the tangent is parallel to the line $y = x$

6) Find the angle between $y = x^2$ and $y = (x-3)^2$

7) If the curves intersect each other orthogonally then $ax^2 + by^2 = 1$ and $cx^2 + dy^2 = 1$ show that $1/a - 1/b = 1/c - 1/d$

8) Find the angle between the curve $y = x^2$ and $x = y^2$ at their points of intersection $(0,0)$ and $(1,1)$

9) Find the angle between the rectangular hyperbola $xy = 2$ and the parabola $x^2 + 4y = 0$.

10) Find the equation of tangent and normal to the curve given by $x = 4\cos t$ and $y = 2\sin t$, $t \in R$ at any point on curve

11) Find the value in the interval $(1/2, 2)$ satisfied by the Rolle's theorem for the function $f(x) = x + 1/x$, $x \in [1/2, 2]$

12) Prove using the Rolle's theorem that between any two distinct real zeros of the polynomial $a_n x^n + a_{n-1} x + \dots + a_1 x + a_0$ there is zero of polynomial $n a_n x^{n-1} + (n-1) a_{n-1} x^{n-2} + \dots + a_1$

13) Find the values in the interval $(1,2)$ of the mean value theorem satisfied by the function $f(x)=x-x^2$ for $1\le x\le 2$

14) Show that the value in the conclusion of the mean value theorem for $f(x)=1/x$ on a closed interval of positive numbers $[a,b]$ is $\sqrt{ab}$

15) Suppose that for a function $f(x)$, $f'(x)\le 1$, $1\le x\le 4$, show that $f(4)-f(1)\le 3$

16) Expand $\log(1+x)$ as a Maclaurin's series upto 4 non zero terms for $-1<x\le 1$

17) Write the Taylor's series expansion of $1/x$ about $x=2$ by finding the first three non zero terms

18) Evaluate the limit $\lim_{x\to 0}\left(\frac{\sin x}{x^2}\right)$

19) Evaluate $\lim_{x\to\infty}(1+2x)^{1/2\log x}$

20) $\lim_{x\to \pi/2}(\sin x)^{\tan x}$

21) Prove that the function $f(x)=x^2-2x-3$ is strictly increasing in $(2,\infty)$

22) Find the intervels of monotonicity and hence find the local extrema for the function $f(x)=x^2-4x+4$

23) Find the local extrema of the function $f(x)=x^4+32x$

24) Find the local maximum and minimum of the function x^2y^2 on the $x+y=10$

25) Find the points on the unit circle $x^2+y^2=1$ nearest and farthest from $(1,1)$

26) Find two positive numbers whose sum is 12 and their product is maximum

27) Find two positive numbers whose product is ~~AA~~ 20 and sum is maximum

28) The volume of cylinder is given by the formula $V=\pi r^2h$ Find the greatest and least values of V if $r+h=6$

29) A hollow cone with base radius a cm and height b cm placed on a table. show that the volume of largest ~~con~~ cylinder that can be hidden underneath is $4/9$ times volume of cone

30) Find the slant asymptote for the function $f(x)$
$$=\frac{x^2-6x+7}{x+5}$$

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