MTS 102

100L 2nd semester
CAT . Agboola

1] Find $\lim_{x \to 0} (\sin x + \cos e^x)$ in 4 decimal Place.

2] If $y = \frac{x+1}{x-1}$, find $(x-1)\frac{d^2y}{dx^2} + \frac{2dy}{dx}$

3] If $y^2(x+3) 20$ Find $\frac{dy}{dx}$ when $x = 2$

4] Find vertical asymptotes $x = \frac{8}{x^2-4}$

5] Find $\lim_{x \to 2} \frac{x-2}{x^2-4} = \frac{1}{4}$

6] Calculus was ~~established~~ established by who?

7] If $f(x) = \frac{x-1}{x+1}$ when $\lim k \to 0$ $\frac{(f(x+t) - f(x))}{k}$

8] Expand & simplify $\sin(\pi + \alpha)$

9] If $\sinh y = \cosh x$, Find the value of $\frac{dy}{dx}$ at point $(1, 0)$

10] Find the limit of $f(x) = \frac{3x^2 - 2x + 1}{2x - 1}$ x ~~appears~~ 1

11] Find the limit of the function $f(x) = \sqrt{x}\sin x$ as x approaches infinity from the right.

12] If $y = \tan^{-1}(x^2+1)$ find the value of $\frac{dy}{dx}$ when $x = -1$

13] The point $[1, 2]$ lies on the curve $Ax^2 + By^2 = 9$ when A & B are constants. If the gradients at the point is $-3/4$. find $(A; B)$

14] If $x^3 + y^3 = 2Txy$ find x

15] A particle moves in a straight line so that the distance Xm travelled after time t is given by $x = t^3 - 4t^2 + 4t$ find the acceleration when particle is at rest.

16] Find $\sin 120^\circ$ in a simple surd form.

17] If $\sin\theta = \frac{5}{13}$ and θ degrees $0 \leq \theta \leq 90^\circ$, evaluate $\cos\theta$

18] The $f(x)$ is given by $f(x) = 2x^3$, write and simplify $\frac{f(x+h) - fx}{h}$, $h \neq 0$

19] If $y = \sqrt{4x^3 + 2x}$ find $\frac{dy}{dx}$

20] If $y = \sqrt{x}^{\frac{1}{2}} + \frac{1}{\sqrt{x}}$ find $\frac{dy}{dx}$

21] find the equation of the tangent to the curve $y = 2x^3 - x^2 + 3x$ at the point where $x = 1$

22] Find the gradient of the tangent to the curve, $y = 2x^2 + 5x - 3$ at the point where $x = 2$.

23] Find $\frac{d^2y}{dx^2}$ in terms of θ when $y = 2\theta x \in \theta^2$

24] Express 2·3 rad in degrees and min

25] Given that $y = \frac{x^4 - 3x^3 - 4x^2 + 5}{2x^2}$ Find $\frac{dy}{dx}$

26] Find the value of k if a function $f(x) = \frac{x^2 + x - 6}{x^2 + kx - 3}$ is not continuous at $x = 3$

27] Let R be the set of real nos, define the function $f: R \to R$ by $f(x) = x^2 - 1$ what is image of $\sin x - \cos x$ under f_x

28] If $y = \sin x$, find $\frac{d^4y}{dx^4}$

29] Expand and simplify $-\cos(90 + \beta)$

30] Domain of f; if $f(x) = \frac{\sqrt{(x-3)(x+2)}}{x-1}$

31] Equation of normal to the curve $x^2 + xy + y^2 = 3$ point $(1, 1)$