m_2 be the slope of the function $y=log_3 x$ at $x=1$. Then_____
$m_1=\frac{m_2}{ln(3)}$

[MTH381] Consider the function $y=f(x)=3e^{-2x}-5e^{-4x}$ and describe.
The function has a local maximum at $x=\frac{1}{2}ln(\frac{10}{3})$

[MTH381] Let $u(x,y,z)$ be a vector field such that $u(0,0,0))=[1,0,1]$ and $div u|_{(0,0,0)}=3.$ Then $div (x^2+2x+y^2-z^2+5)u|_{(0,0,0)}$ is equal to what?
17

[MTH381] Consider the curve whose equation is $x^4+y^4+3xy=5.$ The slope of the tangent line,$\frac{dy}{dx}$, at the point (1,1) is
-1

[MTH381] A particle moves in a circle according to the equation $\bar{r}=cos (t^2)\hat{i}+sin(t^2)\hat{j}$. The magnitude of the normal component of the acceleration at time t is
$4t^2$

[MTH381] The maximum value of $(xy)^6$ on the ellipse $\frac{x^2}{4}+y^2=1$ occurs at point (x,y) for which y^2 is equal to what?
$\frac{1}{2}$

[MTH381] Evaluate the limit $lim_{(x,y)\rightarrow(0,0)}\frac{xy}{x^2+y^2}$
the limit does not exist

[MTH381] The tangent plane to the graph of the function $z=x^2y+\frac{1}{1+y^2}$ at the point $(1,1,\frac{3}{2})$ contains point $(2,2,t)$ for which value of t?
4

[MTH381] Two kinds of bacteria are found in a sample of tainted food. It is found that the populations size of type 1,N_1 and of type 2, N_2 satisfy the equations $\frac{dN_1}{dt}=-k_1N_1, N_1(0)=N_{1,0}$ and $\frac{dN_2}{dt}=-k_2N_2, N_2(0)=N_{2,0}$. Then the population sizes equal $N_1=N_2$ at the following time.
$t=ln(100)$

[MTH381] Consider the vector field $v(x,y)=2x\hat{i}+y\hat{j}$ in the xy plane. Let C be a smooth simple closed curve in the xy-plane plane travelled counterclockwise and enclosing the region of area 10. Let n denote the outer unit normal vector to C. Then evaluate this integral $\oint_c v.n ds.$
30