

DEPARTMENT OF MATHEMATICAL SCIENCES
MATH 301 Methods of Applied Mathematics Term 061

QUIZ # 1(a)

Name _____ ID # _____ Section # _____

Q1 (a) Find the parametric form of curve of intersection given by $z = x^2 + y^2, z = 4, x = 2 \sin t$.

(b) Find the tangent vector to above curve at point P given by $t = \frac{\pi}{4}$ and put it in unit vector form.

(c) Find directional derivative of $f(x, y, z) = x^2 + y^2 + z^2$ in the direction of above tangent vector at the given point P.

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QUIZ # 1(b)

Name _____ ID # _____ Section # _____

Q1) (a) Find the parametric form of curve $x^2 + 4y^2 = 1$.

(b) Find the tangent vector to above curve at $P(\frac{\sqrt{3}}{2}, \frac{1}{4})$ and put it in unit vector form.

(c) Find directional derivative of $f(x, y) = x^2 + 2y^2$ in the direction of above tangent vector.

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QUIZ # 1(c)

Name _____ ID # _____ Section # _____

Q1) Find the arc length of the curve $x = e^t \cos 2t, y = e^t \sin 2t, z = e^t, 0 \leq t \leq 2\pi$.

Q2)(a) Find a vector giving the direction of most rapid decrease of the function

$f(x, y, z) = \ln \frac{yz}{x}$, at $P(\frac{1}{3}, \frac{1}{6}, \frac{1}{2})$. What is the rate of most rapid decrease?

(b) Find directional derivative of the above $f(x, y, z)$ in the direction of vector from $(1, 4, 5)$ to $(2, 5, 4)$