

Math 301 Quiz 1

(A)

Name:.....ID#:.....Ser:.....

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**Q.1:** Show that  $\nabla \cdot [(\mathbf{r} \cdot \mathbf{r}) \mathbf{a}] = 2(\mathbf{r} \cdot \mathbf{a})$ .

**Q.2:** Find the directional derivative of  $f(x, y) = \tan^{-1}\left(\frac{y}{x}\right)$  at  $(2, -2)$  in the direction of  $2\mathbf{i} + 3\mathbf{j}$ .

**Q.3:** Find length of the curve traced by  $\mathbf{r}(t) = e^t \cos 2t \mathbf{i} + e^t \sin 2t \mathbf{j} + e^t \mathbf{k}$  for  $0 \leq t \leq 2\pi$ .