

Math 20E

August 4, 2015

Question 1 The derivative of a function $f(x, y)$ at a point (a, b) is a

A. number.

B. the slope of the tangent plane at (a, b) .

C. the matrix of partial derivatives of f at (a, b) .

D. the gradient of f at (a, b) .

***E.** both **C** and **D**.

Question 2 Given a path $\mathbf{c}(t)$ in \mathbb{R}^n , its derivative $\mathbf{c}'(t)$ represents a tangent vector to the corresponding curve at all values of t where

- A.** the derivative $\mathbf{c}'(t)$ exists.
- B.** the derivative $\mathbf{c}'(t)$ is continuous.
- ***C.** the derivative $\mathbf{c}'(t)$ exists and is not zero.
- D.** $\mathbf{c}'(t)$ is a unit vector.
- E.** both **B** and **C**.

Question 3 Given a function $f(x, y, z)$, the gradient of f at the point (a, b, c) is

- A.** $Df(a, b, c)$, the derivative of f at (a, b, c) .
- B.** A vector that is normal to the level surface $f(x, y, z) = f(a, b, c)$.
- C.** A vector that that points in the direction of greatest increase of $f(x, y, z)$ from (a, b, c) .
- D.** both **B** and **C**.
- *E.** **A**, **B** and **C**.