Multivariable Functions MCQ Questions

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Questions

Q1. A function is called multivariable if its input is made up of multiple numbers.

a. True

b. False

Q2. Which of these are multivariable functions?(*Select Multiple answers*).

a. $f(x) = x^3$

b. $f(x, y) = x^2 + y^2$

c. $f(x, y, z) = xy + 3yz$

d. $f(z) = 3z$

Q3. What is the output of the multivariable function $f(u, v) = f(3, 1) = (u^2 - v, v^2 + u)$.

a. $(4, 2)$

b. $(4, 8)$

c. $(3, 1)$

d. $(8, 4)$

Q4. Let f be the vector-valued function defined by $f(t) = (t^3 + 5t, log2(t))$, find f'(t).

a. $3t + 5, \frac{1}{tlog2}$

b. $3t^2 + 5, \frac{1}{tlog2}$

c. $3t^2 + 5t, log2(t)$

d. $3t^2 + 5, tlog2$

Q5. An object moves through R^3 along a path defined by $r(t) = (t^3, 2t^2 + t, 5t)$ where all dimensions are in meters. Find the object's velocity and its speed when t = 4 seconds.

a. Velocity $r'(4) = (48, 17, 5)$, Speed $|r'(4)| = 51.2m/s$.

b. Velocity $r'(4) = (17, 5, 48)$, Speed $|r'(4)| = 21.2m/s$.

c. Velocity $r'(4) = 51.2m/s$, Speed $|r'(4)| = (48, 17, 5)$.

d. Velocity $r'(4) = (48, 7, 15)$, Speed $|r'(4)| = 51.2m/s$.

Q6. Find $\int r(t)dt$, where $r(t) = (3t^2, \frac{1}{t}, sin(3t))$, where $t > 0$.

a. $(t^3, \ln t, -13cos(3t) + (a, b, c))$

b. $(3t^2, \frac{1}{t^2}, 3cos(3t)$

c. $(t^3, \ln t, -13cos(3t)$

d. $(t^2, \ln t, -13sin(3t) + (a, b, c))$

Answer Key

Q1. True

Q2. $f(x, y) = x^2 + y^2$, $f(x, y, z) = xy + 3yz$

Q3. $(8, 4)$

Q4. $3t^2 + 5$, $\frac{1}{tlog2}$

Q5. Velocity $r'(4) = (48, 17, 5)$, Speed $|r'(4)| = 51.2m/s$.

Q6. $(t^3, \ln t, -13cos(3t) + (a, b, c))$