Multi-variable Functions MCQ Questions

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Questions

Q1. A function is called multi-variable if its input is made up of multiple numbers.

a. True

b. False

Q2. 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. $3t^2 + 5, tlog2$

Q3. 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 $|r'(4)| = 51.2m/s$.

Q4. 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. $(t^2, \ln t, -13sin(3t) + (a, b, c))$

Q5. Find the length of the curve traced by $r(t) = (2cost, 2sint)$ for $0 \leq t \leq \pi$.

a. 2π

b. $\frac{\pi}{2}$

c. $3\frac{\pi}{2}$

d. π

Q6. Which are multi-variable 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. $f(z) = 3z$

Q7. What is the output of the multi-variable function $f(u, v) = f(3, 1) = (u^2 - v, v^2 + u)$.

a. $(4, 2)$

b. $(4, 8)$

c. $(3, 1)$

d. $(8, 4)$

Answer Key

Q1. True

Q2. $3t^2 + 5$, $\frac{1}{tlog2}$

Q3. Velocity $r'(4) = (48, 17, 5)$, Speed $|r'(4)| = 51.2m/s$.

Q4. $(t^3, \ln t, -13cos(3t) + (a, b, c))$

Q5. 2π

Q6. $f(x, y) = x^2 + y^2$, $f(x, y, z) = xy + 3yz$

Q7. $(8, 4)$