

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Calculate the flux of the field F across the closed plane curve C .

- 1) $F = xi + yj$; the curve C is the closed counterclockwise path around the rectangle with vertices at $(0, 0)$, $(4, 0)$, $(4, 3)$, and $(0, 3)$ 1) _____
 A) 24 B) 7 C) 25 D) 0

Calculate the flow in the field F along the path C .

- 2) $F = (x - y)i - (x^2 + y^2)j$; C is curve from $(4, 0)$ to $(-4, 0)$ on the upper half of the circle $x^2 + y^2 = 16$ 2) _____
 A) 8 B) - 8 C) $\frac{16}{4} - 1$ D) 16

Test the vector field F to determine if it is conservative.

- 3) $F = xyi + yj + zk$ 3) _____
 A) Conservative B) Not conservative
- 4) $F = \left(ze^{x+y} - \frac{1}{x} \right)i + ze^{x+y}j + e^{x+y}k$ 4) _____
 A) Not conservative B) Conservative

Find the potential function f for the field F .

- 5) $F = \frac{1}{z}i - 2j - \frac{x}{z^2}k$ 5) _____
 A) $f(x, y, z) = \frac{x}{z} + C$ B) $f(x, y, z) = \frac{x}{z} - 2y + C$
 C) $f(x, y, z) = \frac{x}{z} - 2 + C$ D) $f(x, y, z) = \frac{2x}{z} - 2y + C$

Evaluate. The differential is exact.

- 6) $\int_{(1, 1, 1)}^{(5, 3, 4)} \frac{1}{x} dx + \frac{1}{y} dy + \frac{1}{z} dz$ 6) _____
 A) $\ln 12$ B) $\ln 20$ C) $\ln 60$ D) 0

Using Green's Theorem, compute the counterclockwise circulation of F around the closed curve C .

- 7) $F = (x - y)i + (x + y)j$; C is the triangle with vertices at $(0, 0)$, $(4, 0)$, and $(0, 9)$ 7) _____
 A) 0 B) 72 C) 324 D) 36

Using Green's Theorem, find the outward flux of F across the closed curve C .

- 8) $F = xyi + xj$; C is the triangle with vertices at $(0, 0)$, $(5, 0)$, and $(0, 3)$ 8) _____
 A) $\frac{15}{2}$ B) 0 C) 20 D) - 5