Exam

Name\_\_\_\_\_

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

Evaluate the line integral along the curve C.

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1) 
$$\int_{C} (xz + y^2) ds, C \text{ is the curve } r(t) = (8 - 2t)i + tj - 2tk, 0 \le t \le 1$$
1) 
$$A) \frac{29}{3}$$
B) - 19
C) 29
D) -  $\frac{19}{3}$ 
Find the work done by F over the curve in the direction of increasing t.
2) F = -5yi + 5xj + 6z^7k; C: r(t) = cos ti + sin tj, 0 \le t \le 3
A) W = 15
B) W =  $\frac{45}{2}$ 
C) W = 0
D) W = 30
Calculate the circulation of the field F around the closed curve C.
3) F = xy^2i + x^2yj; curve C is the counterclockwise path around C<sub>1</sub>  $\cup$  C<sub>2</sub> : C<sub>1</sub>: r(t) 6 cos ti + 6 sin tj, 0 ≤ t 3)
$$\int_{C} \frac{1}{2} \frac{\pi}{C_2} r(t) = ti, -6 \le t \le 6$$
A) 0
B) 72
C) 6
D) 36
Calculate the flux of the field F across the closed plane curve C.
4) F = x^2i + y^2j; the curve C is the closed plane curve C.
4) F = x^2i + y^2j; the curve C is the closed counterclockwise path around the triangle with vertices at (0, 0), (3, 0), and (0, 1)
A) 12
B) 0
C) 2
D) 4
Calculate the flow in the field F along the path C.
5) F =  $\nabla(xy^2z^3)$ ; C is the line segment from (6, 1, 1) to (7, 1, -1)
A) 23
B) 14
C) -13
D) -8

Solve the problem.

6) The radial flow field of an incompressible fluid is shown below. Which of the closed paths would exhibit a non-zero flux?





D) A, B, and C

6)