Fayed Raza 12/6/13

17.1: 1, 3, 5, 7, 9, 13

1. $\int\int (x-0)\,dx\,dy$

$\int_0^1 \int_0^{x^2/2} x\,dx\,dy$

$\int \frac{1}{2}\,dy = 0$

3. $\int_0^1 \int_0^1 2y - 2x\,dx\,dy$

$2xy - x^2 \Big|_0^1$

$\int_0^1 2y - 1\,dy$

$y^2 - y \Big|_0^1$

$0 - 0 = 0$

5

$$\int_0^{\frac{\pi}{2}} x^3 \, dx$$

$$\left(\frac{1}{2}\right)^4 = \frac{1}{16}$$

7.

$$\int_0^1 \int_{y^2}^{y} 2x \, dx \, dy$$

$$\int_0^1 y^2 - y^4 \, dy \qquad \frac{1}{6}$$

$$\frac{x^3}{3} - \frac{y^2}{2} = \frac{1}{3} - \frac{1}{2} = \frac{2}{6} - \frac{3}{6} = -\frac{1}{6}$$

9.

$$\int_0^2 \int_0^4 e^{x+y} - e^{x-y} \, dx \, dy$$

$$\int_0^4 e^{4+y} - e^{4-y} \, dy \qquad 4e^4 - e^4$$

$$\iint (1-3) \, dx \, dy$$

13

$$\int_0^6 \int_0^2 -2 \, dx \, dy \qquad -24$$

$$\int_0^6 -4 \, dy \qquad 24$$

17.2: 1, 3, 5, 9, 11, 13

1.

$$\begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ 2xy & x & y+z \end{vmatrix}$$

$0i - 0j + 0k$

Curl is zero

3.

$$\begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ e^{y-z} & xy & 0 \end{vmatrix}$$

$0i - 0j + 0k$

Curl is zero

5.

$$\begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ e^{z^2} - y & e^{z^3} + x & \cos(xz) \end{vmatrix}$$

$\frac{\partial}{\partial y}(\cos(xz)) - \frac{\partial}{\partial z}(e^{z^3} + x)$

$\langle -3z^2 e^{z^3}, -2ze^{z^2} + z\sin(xz), 0 \rangle$

$$\int_0^1 \int_0^1 -3z^2 e^{z^3} - 2ze^{z^2}$$

$$z \int_0^1 (-3ze^{z^3} - e^{z^2}) \, dz$$

$e^{z^3} - k$ | 0

$e^1 - 1$ | $z(e-1)$

9. $\begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial y} \\ \langle yz, xz, xy \rangle \end{vmatrix}$

$\langle x-0, y-2, z-2 \rangle$

$\langle x, y-2, 0 \rangle$ $\int_0^2 \int_1^4 -1 \, dy\,dx$

$\int_0^4 4\,dx$ (0)

11. $\begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ 3x & -2x & 3x \end{vmatrix}$ $\langle 0, 3, -3 \rangle$

$\int_0^{\pi} \int_0^2 3\,dx\,dy$

(6π)

13. $\begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ y & z & x \end{vmatrix}$ $\langle -1, 1, -1 \rangle$

$\int_0^0 \int_0^0 -1\,dx\,dy$

(0)