

MATH 2443

3rd Midterm Review Answer Key

1. 5
2. (a) 1
(b) 5
3. 2
4. $2\pi\left(\frac{4\sqrt{2}}{5} - \frac{2\sqrt{2}}{3} - \frac{1}{5} + \frac{1}{3}\right)$
5. $\int_0^\pi (1 + \sin(t))\sqrt{1 + \cos^2(t)} dt$
6. -2
7. $-\frac{1}{2}e^4 + e^2 - \frac{3}{2}$
8. -3
9. (a) curl is $\langle -e^z - (-e^z), e^x - e^x, e^y - e^y \rangle = \langle 0, 0, 0 \rangle$, divergence is $ze^x + xe^y - ye^z$
(b) F is conservative, $f(x, y, z) = xe^y + ze^x - ye^z$
(c) $2e^2 - e$
10. (a) 1
(b) 0
(c) $2/3$
11. $1/2$
12. $A = 6, B = -2, C = 2, 3e + 2$
13. $\frac{\pi}{6}(37\sqrt{37} - 1)$
14. $\pi(2 - \sqrt{3})$
15. $14/9$
16. $\frac{\sqrt{6}}{6}$
17. (a) $x + z = \pi/2$
(b) $\int_0^\pi \int_0^2 \sqrt{1 + u^2} dudv$
(c) $\frac{14\pi}{3}$
(d) $\frac{2}{3}\pi^3$