

Exam 3 Review Answers

1. 2

2. $e - 2$

3. $\frac{2}{9}e^3 - \frac{4}{45}$

4. $\frac{1}{4}(1 - \cos 1)$

5. $\frac{1}{40}$

6. $\frac{40}{3}$

7. $\frac{81}{5}\pi$

8. $\frac{32}{9}$

9. $\frac{32}{3}$

10. $\frac{10}{3}$

11. $\frac{\pi}{14}$

12. $\frac{512}{27}\pi\left(1 - \frac{\sqrt{2}}{2}\right)$

13. $\frac{\pi}{3}$

14.

$$\begin{aligned} \int_0^1 \int_{-\sqrt{y}}^{\sqrt{y}} \int_z^{1-y} f(x, y, z) \, dz \, dx \, dy & \quad \int_0^1 \int_0^{1-y} \int_{-\sqrt{y}}^{\sqrt{y}} f(x, y, z) \, dx \, dz \, dy \\ \int_0^1 \int_0^{1-z} \int_{-\sqrt{y}}^{\sqrt{y}} f(x, y, z) \, dx \, dy \, dz & \quad \int_0^1 \int_{-\sqrt{1-z}}^{\sqrt{1-z}} \int_{x^2}^{1-z} f(x, y, z) \, dy \, dx \, dz \\ & \quad \int_{-1}^1 \int_0^{1-x^2} \int_{x^2}^{1-z} f(x, y, z) \, dy \, dz \, dx \end{aligned}$$

15. $9x - 12y + 4z = 0$

16. $2x + y - \sqrt{3}z = 0$

17. $16a^2$

18. $16a^2(2 - \sqrt{2})$

19. $\frac{\sqrt{2}}{3} + \ln|\sqrt{2} + \sqrt{3}|$

20. $\left(\frac{4a}{3\pi}, \frac{4a}{3\pi}\right)$

21. $\left(\frac{5\pi a}{32}, \frac{5a}{8}\right)$

22. $\left(0, 0, \frac{4}{5}a\right)$

23. $\frac{1}{90}$

24. $2 \ln |\sec 1 + \tan 1|$

25. $\frac{35}{256}$