

Answers

Spring 2015 Math 125 Final Exam

1. (a) $-\frac{1}{3}t^3 \cos t^3 + \frac{1}{3} \sin t^3 + C$
(b) $-2 \ln(\sqrt{x}) - \frac{2}{\sqrt{x}} + 2 \ln(\sqrt{x} + 1) + C$
2. (a) $\ln(2) - 2 + \frac{\pi}{2}$
(b) $\frac{16}{3} - \frac{8}{3}\sqrt{2}$
3. π
4. $b^3 - 12b + 32$
5. (a) $\pi \int_0^1 (3 - 2y)^2 - (2 - y)^2 dy$
(b) $2\pi \int_0^1 (x + 1) \left(\frac{x}{2}\right) dx + 2\pi \int_1^2 (x + 1) \left(1 - \frac{x}{2}\right) dx$
6. (a) $\int_0^1 40\pi(1 - y) \sin^{-1} y dy$
(b) $15\pi^2 - 40\pi$
7. (a) $\int_{-2}^2 \sqrt{1 + (x^2 + x)^2} dx$
(b) $\frac{1}{3} (6 + 5\sqrt{5} + \sqrt{37})$
8. $\frac{4}{3\pi}r$
9. $y = \tan^{-1}(\ln(x^2 + e))$
10. (a) $y = 20A + (20,000 - 20A)e^{t/20}$
(b) $\frac{1000\sqrt{e}}{\sqrt{e} - 1}$