

Instructions: There are twenty problems of equal credit. Some questions are easier than others so you are encouraged to read the entire exam before beginning your work. Make sure that you have all 20 problems.

1. Initially, there is 10 pounds of a radioactive element. After 2 days there is 8 pounds. How many pounds are there after 3 days?
2. The region bounded by the graphs of $y = x$, $y = e^{x-1}$ and $x = 0$ is revolved about the x -axis. Find the volume of the resulting solid.
3. Use the trapezoidal rule with $n = 4$ subintervals to approximate $\int_0^1 e^{2x} dx$. Do not simplify.
4. Find $\int_{-1}^2 |x| dx$.
5. Find $\frac{d}{dx} \frac{\ln x}{x}$.
6. Find $\int e^3 dy$
7. Find $\int x(x-1)^{10} dx$.
8. Find $\frac{d}{dx} (\sin x)^x$.
9. Find $\int \frac{x+2x^2}{\sqrt{x}} dx$.
10. Find $\int x^3 \ln x dx$.
11. Find $\int \frac{x}{x^2+1} dx$.
12. Find $\int x \sin x dx$.
13. Find $\int \frac{\sin x}{\cos^2 x} dx$.
14. Find $\int_0^1 x\sqrt{1-x} dx$.
15. Find $\int_0^1 \frac{e^x}{e^x+1} dx$.
16. Find $\int (2x+1)^{10} dx$.
17. Find $\int_0^1 x\sqrt{1-x^2} dx$.
18. Find the area of the region bounded by the graphs of $y = 4-x^2$ and $y = x^2$. Do not simplify.
19. Find $\int \frac{6x+7}{x^2+4x+4} dx$.
20. The region under the graph of $y = \frac{1}{1+\sqrt{x}}$, between $x = 0$ and $x = 1$, is revolved about the x -axis. Find the volume of the resulting solid.