

1. Evaluate $\int \left(2x^3 - 4x^2 + \frac{4}{x^2} + \frac{1}{x} \right) dx$
2. Evaluate $\int \frac{x^2 - x + \sqrt{x}}{\sqrt[3]{x}} dx$
3. Evaluate $\int (\sin 2y + \cos 3y) dy$
4. Evaluate $\int (\sec^2 \theta + \sec \theta \tan \theta) d\theta$
5. Evaluate $\int (e^{2x} + e^{-3x}) dx$
6. Evaluate $\int \frac{1}{16 + x^2} dx$
7. Evaluate $\int \frac{3}{\sqrt{25 - x^2}} dx$
8. Evaluate $\int 12xe^{-3x^2} dx$
9. Evaluate $\int \sin \theta \sqrt{1 - \cos \theta} d\theta$
10. Evaluate $\int \frac{x^2 + 2x - 2}{x^3 + 3x^2 - 6x} dx$
11. Evaluate $\int \frac{\cos(\ln x)}{x} dx$
12. Evaluate $\int_0^{\ln 2} \frac{e^x}{1 + e^{2x}} dx$
13. Evaluate $\int \frac{(\arctan x)^5}{1 + x^2} dx$
14. Evaluate $\int \sin^2 5\theta d\theta$
15. Evaluate $\int (2x - 5)^{1.4} dx$
16. Evaluate $\int \frac{1}{x \ln x} dx$
17. Evaluate $\int \frac{(\sqrt{x} + 1)^4}{2\sqrt{x}} dx$
18. Evaluate $\int x^2 \sec^2(x^3) dx$
19. Evaluate $\int \sin^{10} \theta \cos \theta d\theta$
20. Evaluate $\int_0^{\sqrt{2}} x\sqrt{x^2 + 1} dx$
21. Evaluate $\int_{-2}^2 e^{4x+8} dx$
22. Estimate $\int_1^3 (x^2 + 2) dx$ by using a Riemann sum with 4 subintervals and the right endpoint.
23. Use geometry to evaluate $\int_0^2 -\sqrt{4 - x^2} dx$. Hint, graph $y = -\sqrt{4 - x^2}$.
24. Evaluate $\int_{-2}^3 |2 - x| dx$
25. Find f by solving the initial value problem $f'(x) = 7x^6 - 4x^3 + 12$ where $f(1) = 24$.

26. Find the average value of the function $f(x) = \frac{x}{\sqrt{x^2+1}}$ over the interval $[0,3]$.

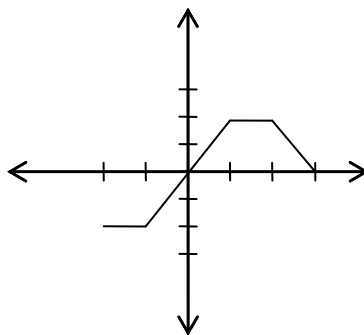
27. If $F(x) = \int_{4x^2}^9 \frac{1}{t} dt$, find $F'(x)$.

28. Combine to write as a single integral $\int_0^8 f(x) dx + \int_{-2}^0 f(x) dx + \int_8^6 f(x) dx$.

29. Suppose that h is function such that $h(1) = -2$, $h'(1) = 2$, $h''(1) = 3$, $h(2) = 6$, $h'(2) = 5$, $h''(2) = 13$, and h'' is continuous everywhere. Evaluate $\int_1^2 h''(x) dx$

30. If f is continuous and $\int_0^4 f(x) dx = 10$, find $\int_0^2 f(2x) dx$.

31. The graph of f is shown below. Use it to evaluate $\int_{-2}^3 f(x) dx$



32. Evaluate

a. $\frac{d}{dx} \int_0^x e^{\arctan t} dt$ b. $\frac{d}{dx} \int_0^1 e^{\arctan x} dx$ c. $\int_0^1 \frac{d}{dx} (e^{\arctan x}) dx$

33. Find the area between the curve $f(x) = x^2 + 3x - 4$ and the x -axis between $x = -1$ and $x = 4$

34. Find the area of the region bounded by the curves $y = 2 - \sqrt{x}$, $y = \sqrt{x}$, and $y = 0$.

Topics:

- ✓ Indefinite Integrals
 - Be sure to know the list of indefinite integrals in section 4.8 (or on the list provided in class).
 - Know how to use the substitution rule.
 - Initial value problems
- ✓ Using the Riemann Sum to estimate a definite integral.
- ✓ Fundamental Theorem of Calculus, part 1 and 2
- ✓ Definite Integrals
 - Evaluate definite integrals
 - Average value of a function
 - Mean Value Theorem for Integrals
 - Substitution Rule
- ✓ Find the area between a curve and the x -axis between $x = a$ and $x = b$.

For additional problems, check out the problems in section 4.8, the review problems for Chapter 5.

Note the questions above are simply a sample of questions possible for the exam; it is possible that other types of questions may appear on your exam.