

Cal II Homework 11

1. Calculate the derivative.

$$\frac{d}{dx} \int_{\sqrt{x}}^{\sqrt{x^2}} \tan t \, dt$$

2. $\frac{d}{dx} \left[\int_1^x \sqrt{t^2+2} \, dt \right]$ Find the derivative using Part 1 of the Fundamental Theorem of Calculus.

3. Find the derivative using Part 1 of the Fundamental Theorem of Calculus $\frac{d}{dx} \left[\int_3^x \frac{t+3}{t} \, dt \right]$

4. Find the derivative using Part 1 of the Fundamental Theorem of Calculus $\frac{d}{dx} \left[\int_{-2}^x (t^6+8)^{1/3} \, dt \right]$

5. Find the derivative using Part 1 of the Fundamental Theorem of Calculus $\frac{d}{dt} \left[\int_4^t e^x \, dx \right]$

6. Find the derivative using Part 1 of the Fundamental Theorem of Calculus $\frac{d}{dx} \left[\int_4^{\sqrt{x}} \sqrt{t^4+4} \, dt \right]$

7. Find the derivative using Part 1 of the Fundamental Theorem of Calculus $\frac{d}{dx} \left[\int_x^4 \sin(t^2) \, dt \right]$

8. Find the derivative using Part 1 of the Fundamental Theorem of Calculus $\frac{d}{dx} \left[\int_{4x^2}^4 (5t)^{3/4} \, dt \right]$

9. Find the derivative using Part 1 of the Fundamental Theorem of Calculus $\frac{d}{dx} \left[\int_{x^2}^4 e^{11t} \, dt \right]$

10. Evaluate the integral using the Fundamental Theorem of Calculus
 solve $\int_{1/2}^1 \frac{8}{x^3} dx$
11. Find the definite integral given that $\int_2^5 f(x) dx = 6$, $\int_2^5 g(x) dx = -4$.
 solve $\int_2^5 [f(x) + g(x)] dx$
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13. Find the definite integral given that $\int_3^4 f(x) dx = 5$, $\int_3^4 g(x) dx = 2$.
 solve $\int_3^4 [3f(x) + 4g(x)] dx$
14. Find the definite integral given that $\int_2^3 f(x) dx = 9$, $\int_1^3 g(x) dx = -2$,
 $\int_2^3 f(x) dx = 9$, $\int_2^3 g(x) dx = 4$.
 solve $\int_1^3 [2f(x) - 4g(x)] dx$
15. Find the definite integral using the Fundamental Theorem of Calculus and properties of the definite integral.
 $\int_0^1 (t^5 - t^{5/4}) dt$
16. Find the definite integral using the Fundamental Theorem of Calculus and properties of the definite integral.
 $\int_{-1}^0 (x + x^2) dx$
17. $\int_{\pi/2}^{\pi} 8 \sin x dx$
19. $\int_{-4}^3 [(x-1)(x+3)] dx$
18. $\int_1^4 (\sqrt{x} - 4x) dx$
20. $\int_0^1 (z^3 + z)^2 dz$
21. $\int_1^3 \frac{x^2 - 27}{x^4} dx$
22. $\int_0^1 (1 + \frac{9}{1+x^2}) dx$

23. Assuming that $\int_1^3 f(x) dx = 3$, $\int_0^2 f(x) dx = 6$, and $\int_1^4 f(x) dx = 5$ calculate $\int_2^4 f(x) dx$

24. Find the definite integral using the Fundamental Theorem for 24 and 25

24. $\int_1^9 \frac{x+3}{\sqrt{x}} dx$

25. $\int_0^7 \frac{2}{3x} dx$

Find the indefinite integral for 26 and 27

26. $\int x^{7/9} dx$

27. $\int \frac{2}{\sqrt{1-x^2}} dx$

Find the indefinite integral for 28-30

28. $\int t^{-7} dt$

29. $\int \frac{5}{1+x^2} dx$

30. $\int \frac{5x^2 + 4xe^x - 1}{x} dx$

Find the indefinite integral using the given substitution.

(use C for the constant of integration.) for 31-33

31. $\int e^{11x+1} dx$; let $u = 11x+1$

32. $\int (4-x^2)^6 x dx$; let $u = 4-x^2$

33. $\int 11 \sin^9 x \cos x dx$; let $u = \sin x$

34. Evaluate the indefinite integral (use C for the constant)
 $\int x(5x+4)^{13} dx$

35. Find the indefinite integral. (use C for the constant)
 $\int 6 \sin(9x) dx$

36. $\int 5x^9 \sin x^{10} dx$

x, y, z

Find the indefinite integral. (use C for the constant for ~~37~~ 37-

37. $\int \frac{9e^{1/x}}{x^2} dx$

38. $\int \frac{x^4}{x^5-1} dx$

39. $\int \frac{11\cos(12x)}{\sin(12x)} dx$

40. $\int 10 \tan(7x) dx$

41. $\int 3 \sin x \cdot e^{\cos x} dx$

42. $\int x \sqrt{4-x} dx$

43. $\int (4x^3 - 3x^2 + 7x - 2) dx$

44. $\int (2x^5 - 4x^4 - x^2 - 3) dx$

45. $\int (\frac{5}{x^3} + 7) dx$

46. $\int (2\sqrt{z} + 9z) dz$

47. $\int (9t^{3/2} + 10t^{1/2}) dt$

48. $\int u(u-9) du$

49. $\int t^2(t+7) dt$

50. $\int \frac{7x^5+8}{x^2} dx$

51. $\int \frac{t^2-16}{t-4} dt$

52. $\int (4x+5)^2 dx$

53. $\int 3(x^2+1)^2 dx$