AP Calculus AB
Section 3.2: The Indefinite Integral
Worksheet 12b: Reversing the Chain Rule

Find the general antiderivatives in Problems 1 - 20. Remember, you can check your answers.

1. $\int x(x^2+2)^8\,dx$

2. $\int y^2(y^3-5)^5\,dy$

3. $\int \frac{1}{\sqrt{4-x}}\,dx$

4. $\int z(z^2-4)\,dz$

5. $\int \frac{1}{x+7}\,dx$

6. $\int (4t-5)^{99}\,dt$

7. $\int (x^2+3)^2\,dx$

8. $\int \sin\theta(\cos\theta+2)^9\,d\theta$

9. $\int \sqrt{\cos 3x}\,\sin 3x\,dx$

10. $\int x\,e^{-x^2}\,dx$

11. $\int \sin^6\theta\cos\theta\,d\theta$

12. $\int x^2\,e^{x^3+1}\,dx$

13. $\int \frac{(\ln z)^2}{z}\,dz$

14. $\int \frac{e^t+1}{e^t+t}\,dt$

15. $\int \frac{y}{y^2+4}\,dy$

16. $\int \frac{e^x - e^{-x}}{e^x + e^{-x}}\, dx$

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

18. $\int \frac{x+1}{x^2 + 2x + 19}\, dx$

19. $\int (2x + 1)\, e^{x^2} e^x\, dx$ [Hint: Rewrite $e^{x^2} e^x = e^{?}$.]

20. $\int \sin^3 x\, dx$ [Hint: Use the identity $\cos^2 x + \sin^2 x = 1$]

Find each indefinite integral. The evaluation process in the problems below involve more complex substitutions.

21. $\int x\sqrt{x + 1}\, dx$

22. $\int \frac{x}{\sqrt{x+2}}\, dx$

23. $\int x\sqrt{x - 9}\, dx$

24. $\int x(x - 4)^9\, dx$