

PRACTICE-1

Name _____

Integrate the following:

1. $\int 3x\sqrt{5+x^2} dx = (5+x^2)^{3/2} + c$

2. $\int 4\sqrt[3]{x} \ln(x) dx = 3x^{4/3} \ln x - \frac{9}{4}x^{4/3} + c$

3. $\int \arcsin(x) dx = x \arcsin x + \sqrt{1-x^2} + c$

4. $\int \cos^3(3x) \sin(3x) dx = -\frac{1}{12} \cos^4(3x) + c$

5. $\int \frac{(\ln(x))^4}{x} dx = \frac{1}{5}(\ln(x))^5 + c$

6. $\int \frac{7x}{\sqrt{1-x^2}} dx = -7\sqrt{1-x^2} + c$

7. $\int 3x^2 \cos 3x dx = x^2 \sin(3x) + \frac{2}{3}x \cos(3x) - \frac{2}{9} \sin(3x) + c$

8. $\int \sin(\sqrt{x}) dx$ (let $u = \sqrt{x}$ so $u^2 = x$)
 $= 2 \sin(\sqrt{x}) - 2\sqrt{x} \cos(\sqrt{x}) + c$

9. $\int \frac{4}{25-x} dx = -4 \ln(25-x) + c$

10. $\int \frac{5}{6e^{2x}} dx = -\frac{5}{12}e^{-2x} + c$

11. $\int \frac{x^3}{1+9x^4} dx = \frac{1}{36} \ln(1+9x^4) + c$

12. $\int \frac{x}{1+9x^4} dx = \frac{1}{6} \arctan(3x^2) + c$

13. $\int x(3^x) dx = \frac{x}{\ln 3} 3^x - \frac{1}{(\ln 3)^2} 3^x + c$

14. $\int ((x + \sin x)^3 + \cos x(x + \sin x)^3) dx = \frac{1}{4}(x + \sin x)^4 + c$

15. $\int 3 \sin^3 x \cos^3 x dx = \frac{3}{4} \sin^4 x + \frac{1}{2} \sin^6 x + c$
16. $\int x \cos^2 (2x) dx = \frac{1}{4} x^2 + \frac{1}{4} x \sin (2x) + \frac{1}{8} \cos (2x) + c$
17. $\int x^3 \sqrt{1-x^2} dx = -\frac{1}{3} (1-x^2)^{3/2} + \frac{1}{5} (1-x^2)^{5/2}$
18. $\int_0^4 \sqrt{25-x^2} dx = \left(\frac{1}{2} x \sqrt{25-x^2} + \frac{25}{2} \arcsin (x/5) \right)_0^4$
19. $\int \frac{2x+1}{x^2+5x+6} dx = -3 \ln (x+2) + 5 \ln (x+3)$
20. $\int \frac{5}{x^2-1} dx = -\frac{5}{2} \ln (x-1) + \frac{5}{2} \ln (x+1)$
21. $\int \frac{6x}{x^2+4x+4} dx = \frac{12}{x+2} + 6 \ln (x+2)$
22. $\int \frac{x^2-3x+7}{x^3+x} dx = 7 \ln (x) - 3 \ln (x^2+1) - 3 \arctan (x)$
23. $\int \frac{3x^2}{x^2-x-12} dx = 3x + \frac{48}{7} \ln (x-4) - \frac{27}{7} \ln (x+3)$
24. $\int \frac{2x^3+x+1}{x^2+9} dx = x^2 - \frac{17}{2} \ln (x^2+9) + \frac{1}{3} \arctan (x/3)$