Integration with U-Substitution & By Parts Practice **Name** _____

Evaluate the indefinite or definite integrals using quick integral rules, u-substitution, or by parts methods.

1. $\int 4 \sin 5x \, dx$

2. $\int 8e^{3x} \, dx$

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

4. $\int \csc(\pi x) \cot(\pi x) \, dx$

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

6. $\int \frac{e^{-5x}}{2} \, dx$

7. $\int 2\sqrt{9x - 5} \, dx$

8. $\int \, dx$

9. $\int \sin\theta \cos^3\theta \, d\theta$ Let u = cosθ

10. $\int \frac{(\ln x)^3}{x} dx$ Let u = $\ln x$

11. $\int_0^1 e^{2x} \cos(e^{2x}) \, dx$

12. $\int x^3 \cos(5x) \, dx$

13. $\int_0^1 e^{5x} x^2 dx$

14. $\int_{-2}^{3} 7^{x-6}$

15. $\int 7x^2 e^{x^3} dx$

16. $\int x \cdot 4^{5x^2} \ dx$

17. $\int_1^2 \frac{10x}{8-x^2} dx$

18. $\int x^4 \ln x \ dx$

19. $\int \frac{e^{3x}}{2-e^{3x}} \ dx$

20. $\int_{\frac{\pi}{2}}^{\pi} x^2 \sin x \ dx$

21. $\int_1^e -\frac{10}{x} \ dx$

22. $\int_{-1}^3 \frac{2x}{\sqrt{1+4x^2}} \ dx$

ANSWERS

1. $-\frac{4}{5}\cos 5x + c$
2. $\frac{8}{3}e^{3x} + c$
3. $-\frac{7}{3}\tan(2-3x) + c$
4. $-\frac{1}{\pi}\csc \pi x + c$
5. $\frac{(2x-5)^5}{10} + c$
6. $-\frac{1}{10e^{5x}} + c$
7. $\frac{4(9x-5)^{\frac{3}{2}}}{27} + c$
8. $x + c$
9. $\frac{-\cos^4\theta}{4} + c$
10. $\frac{(\ln x)^4}{4} + c$
11. $\frac{1}{2}\sin(e^2) - \frac{1}{2}\sin 1$
12. $\frac{1}{5}x^3 \sin 5x + \frac{3}{25}x^2 \cos 5x - \frac{6}{125}x \sin 5x - \frac{6}{625}\cos 5x + c$
13. $\frac{17}{125}e^5 - \frac{2}{125}$
14. $\frac{1}{7^3 \ln 7} - \frac{1}{7^8 \ln 7}$
15. $\frac{7}{3}e^{x^3} + c$
16. $\frac{4^{5x^2}}{10 \ln 4} + c$
17. $-5 \ln 4 + 5 \ln 8$ *or* $5 \ln 2$
18. $\frac{1}{5}x^5 \ln x - \frac{1}{25}x^5 + c$
19. $\frac{1}{3}\ln|2 - e^{3x}| + c$
20. $\pi^2 - \pi - 2$
21. -10
22. $\frac{1}{2}\sqrt{37} - \frac{1}{2}\sqrt{5}$