

HW1 (3/7 繳交)

8–70 Find the limit. Use l’Hospital’s Rule where appropriate. If there is a more elementary method, consider using it. If l’Hospital’s Rule doesn’t apply, explain why.

[6-8] 8

8. $\lim_{x \rightarrow 3} \frac{x - 3}{x^2 - 9}$

[6-8] 12

12. $\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$

[6-8] 15

15. $\lim_{t \rightarrow 0} \frac{e^{2t} - 1}{\sin t}$

[6-8] 27

27. $\lim_{x \rightarrow 0} \frac{e^x + e^{-x} - 2}{e^x - x - 1}$

[6-8] 63

63. $\lim_{x \rightarrow \infty} x^{1/x}$

1–4 Evaluate the integral using integration by parts with the indicated choices of u and dv .

[7-1] 3

3. $\int x \cos 4x \, dx; \quad u = x, \quad dv = \cos 4x \, dx$

5–42 Evaluate the integral.

[7-1] 7

7. $\int x \sin 10x \, dx$

[7-1] 15

15. $\int t^4 \ln t \, dt$

[7-1] 29

29. $\int_0^1 x 3^x \, dx$

43–48 First make a substitution and then use integration by parts to evaluate the integral.

[7-1] 47

47. $\int x \ln(1 + x) dx$

57–60 Use integration by parts to prove the reduction formula.

[7-1] 57

57. $\int (\ln x)^n dx = x(\ln x)^n - n \int (\ln x)^{n-1} dx$

1–56 Evaluate the integral.

[7-2] 1

1. $\int \sin^3 x \cos^2 x dx$

[7-2] 5

5. $\int \sin^5(2t) \cos^2(2t) dt$

[7-2] 15

15. $\int \sin x \sec^5 x \, dx$

[7-2] 21

21. $\int \tan x \sec^3 x \, dx$

[7-2] 23

23. $\int \tan^2 x \, dx$

5–8 Evaluate the integral using the indicated trigonometric substitution. Sketch and label the associated right triangle.

[7-3] 5

5. $\int \frac{x^3}{\sqrt{1 - x^2}} \, dx \quad x = \sin \theta$

[7-3] 7

7. $\int \frac{\sqrt{4x^2 - 25}}{x} \, dx \quad x = \frac{5}{2} \sec \theta$

9-36 Evaluate the integral.

[7-3] 11

$$11. \int \frac{\sqrt{x^2 - 1}}{x^4} dx$$

[7-3] 16

$$16. \int_0^{2/3} \sqrt{4 - 9x^2} dx$$