

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

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