HW2 (3/21 繳交)

7–40 Evaluate the integral.

[7-4] 7

7. $\displaystyle\int \frac{5}{(x-1)(x+4)}\,dx$

[7-4] 11

11. $\displaystyle\int_0^1 \frac{2}{2x^2+3x+1}\,dx$

[7-4] 21

21. $\displaystyle\int \frac{dt}{(t^2-1)^2}$

41–56 Make a substitution to express the integrand as a rational function and then evaluate the integral.

[7-4] 42

42. $\displaystyle\int \frac{dx}{2\sqrt{x+3}+x}$

[7-4] 55

55. $\displaystyle\int \frac{dx}{1+e^x}$

57–58 Use integration by parts, together with the techniques of this section, to evaluate the integral.

[7-4] 57

57. $\int \ln(x^2 - x + 2)\, dx$

9–93 Evaluate the integral.

[7-5] 9

9. $\int \frac{\cos x}{1 - \sin x}\, dx$

[7-5] 13

13. $\int \frac{\ln(\ln y)}{y}\, dy$

[7-5] 21

21. $\int \frac{\cos^3 x}{\csc x}\, dx$

[7-5] 22

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

7–18 Use (a) the Trapezoidal Rule, (b) the Midpoint Rule, and (c) Simpson's Rule to approximate the given integral with the specified value of n.

[7-7] 8

8. $\int_1^4 \sin\sqrt{x}\,dx, \quad n = 6$

[7-7] 22

22. How large should n be to guarantee that the Simpson's Rule approximation to $\int_0^1 e^{x^2}\,dx$ is accurate to within 0.00001?

5–48 Determine whether the integral is convergent or divergent. Evaluate integrals that are convergent.

[7-8] 5

5. $\int_1^\infty 2x^{-3}\,dx$

[7-8] 7

7. $\int_0^\infty e^{-2x}\,dx$

[7-8] 15

15. $\int_1^\infty \frac{x^2 + x + 1}{x^4}\,dx$

57–64 Use the Comparison Theorem to determine whether the integral is convergent or divergent.

[7-8] 57

57. $\int_0^\infty \frac{x}{x^3 + 1}\,dx$

9–24 Find the exact length of the curve.

[8-1] 9

9. $y = \frac{2}{3}x^{3/2}, \quad 0 \leqslant x \leqslant 2$

[8-1] 11

11. $y = \frac{2}{3}(1 + x^2)^{3/2}, \quad 0 \leqslant x \leqslant 1$

[8-1] 25

25–26 Find the length of the arc of the curve from point P to point Q.

25. $y = \frac{1}{2}x^2, \quad P(-1, \frac{1}{2}), \quad Q(1, \frac{1}{2})$

[8-1] 39

39. Find the length of the astroid $x^{2/3} + y^{2/3} = 1$.