Inverse Trigonometric Functions: Integration

Integrals Involving Inverse Trigonometric Functions

Let u be a differentiable function of x, and let a > 0

$$\int \frac{du}{\sqrt{a^2-u^2}} = \arcsin\frac{u}{a} + C$$

$$\int \frac{du}{a^2+u^2} = \frac{1}{a}\arctan\frac{u}{a} + C$$

$$\int \frac{du}{u\sqrt{u^2-a^2}} = \frac{1}{a}\,arc\sec\frac{|u|}{a} + C$$

1. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{dx}{\sqrt{1-9x^2}}$$

2. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{1}{2+(x-4)^2}\,dx$$

3. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{1}{3x\sqrt{x^4-9}}\,dx$$

4. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{4}{x\sqrt{5-(\ln x)^2}}\,dx$$

5. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{\cos x}{3+\sin^2 x}\,dx$$

6. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{x^4-9}{x^2+3}\,dx$$

7. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{5}{\sqrt{x}(2+x)}\,dx$$

8. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{5x-1}{\sqrt{1-x^2}}\,dx$$

9. Find the indefinite integral
(Similar to p.368 #1-24)

$$\int \frac{x-5}{(x+2)^2+3}\,dx$$

10. Evaluate the integral
(Similar to p.368 #25-38)

$$\int_0^2 \frac{dx}{\sqrt{9-x^2}}$$

11. Evaluate the integral
(Similar to p.368 #25-38)

$$\int_{\ln 3}^{\ln 5} \frac{2e^{-x}}{\sqrt{4-e^{-2x}}}\,dx$$

12. Find or evaluate the integral
(Similar to p.368 #39-50)

$$\int \frac{2x-1}{x^2+4x+5}\,dx$$

13. Find or evaluate the integral
(Similar to p.368 #39-50)

$$\int \frac{5}{\sqrt{-x^2+6x}}\,dx$$

14. Find or evaluate the integral
(Similar to p.368 #39-50)

$$\int \frac{x-4}{\sqrt{x^2-8x}}\,dx$$

15. Find or evaluate the integral
(Similar to p.368 #39-50)

$$\int \frac{x}{\sqrt{4+10x^2-x^4}}\,dx$$

15. Use the specified substitution to find or evaluate the integral
(Similar to p.368 #51-54)

$$\int \frac{\sqrt{x-4}}{x+2}\,dx$$

$$u=\sqrt{x-4}$$

16. Use the specified substitution to find or evaluate the integral
(Similar to p.368 #51-54) NEXT TIME SPRING 2013

$$\int \frac{1}{7\sqrt{5-x}\sqrt{x+2}}\,dx$$

$$u = \sqrt{x+2}$$

17. Find the area of the region
(Similar to p.369 #71-76)

$$y = \frac{3}{x^2+2x+8}$$