

Pythagorean Identities	Other Identities
$\sin^2(x) + \cos^2(x) = 1$	$\sin^2(x) = \frac{1 - \cos(2x)}{2}$
$1 + \cot^2(x) = \csc^2(x)$	$\cos^2(x) = \frac{1 + \cos(2x)}{2}$
$\tan^2(x) + 1 = \sec^2(x)$	

Evaluate the indefinite integral.

1. $\int \sin^3(x) \cos^4(x) dx$

2. $\int \sin^5(x) \cos^2(x) dx$

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

4. $\int \cos^3(x) \sin^5(x) dx$

5. $\int \sin^7(2x) \cos(2x) dx$

6. $\int \sin^5(3x) \cos(3x) dx$

7. $\int \sin^3(2x)\sqrt{\cos(2x)}dx$

8. $\int \sin^5(3x)\sqrt{\cos(3x)}dx$

9. $\int \cos^2(3x) dx$

10. $\int 4\cos^2(2x) dx$

11. $\int x \sin^2(x) dx$

12. $\int x \sin^2(2x) dx$

13. $\int \sec(4x) dx$

14. $\int 6\sec(x) dx$

15. $\int \sec^3(\pi x) dx$

16. $\int \sec^5(2x) dx$

17. $\int \tan^5\left(\frac{x}{2}\right) dx$

18. $\int \tan^3(2x) dx$

19. $\int \tan^3(2x) \sec^3(2x) dx$

20. $\int \tan^3(3x) \sec^3(3x) dx$

21. $\int \sec^6(4x) \tan(4x) dx$

22. $\int \sec^6(2x) \tan(2x) dx$

23. $\int \sec^5(x) \tan^3(x) dx$

24. $\int 4\sec^5(2x) \tan^3(2x) dx$

25. $\int \frac{\tan^2(x)}{\sec(x)} dx$

26. $\int 2 \frac{\tan^2(2x)}{\sec(2x)} dx$

7.4 Worksheet

State the substitution you would use to find the indefinite integral. DO NOT INTEGRATE.

1. $\int \frac{1}{9+x^2} dx$

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

3. $\int \frac{x^2}{\sqrt{25-x^2}} dx$

4. $\int x^2(x^2-25)^{3/2} dx$

Find the indefinite integral using the given substitution.

Use $x = 4 \sin(\theta)$

5. $\int \frac{\sqrt{16-x^2}}{x} dx$

6. $\int \frac{4}{x^2\sqrt{16-x^2}} dx$

Use $x = 5 \sec(\theta)$

7. $\int \frac{1}{\sqrt{x^2-25}} dx$

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

9. $\int x^3 \sqrt{x^2 - 25} dx$

10. $\int \frac{x^3}{\sqrt{x^2-25}} dx$

Use $x = \tan(\theta)$

11. $\int x\sqrt{1+x^2} dx$

12. $\int \frac{1}{(1+x^2)^2} dx$

13. $\int \frac{9x^3}{\sqrt{1+x^2}} dx$

14. $\int \frac{x^2}{(1+x^2)^2} dx$

Figure out the trigonometric substitution and evaluate the indefinite integral.

15. $\int \frac{1}{\sqrt{16-x^2}} dx$

16. $\int \frac{x^2}{\sqrt{36-x^2}} dx$

17. $\int \sqrt{16-4x^2} dx$

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

Figure out the trigonometric substitution and evaluate the definite integral.

19. $\int_0^{\sqrt{3}/2} \frac{t^2}{(1-t^2)^{3/2}} dt$

20. $\int_0^{\sqrt{3}/2} \frac{1}{(1-t^2)^{5/2}} dt$

State the method of integration that you would use to perform each integration. Explain why you chose it.

DO NOT INTEGRATE.

21. $\int x\sqrt{x^2 + 1} dx$

22. $\int x^2\sqrt{x^2 - 1} dx$

7.5 Worksheet

Use Partial Fractions to evaluate the indefinite integral.

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

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

3. $\int \frac{5}{x^2+3x-4} dx$

4. $\int \frac{3-x}{3x^2-2x-1} dx$

5. $\int \frac{x^2+12x+12}{x^3-4x} dx$

6. $\int \frac{x^3+3x^2-x-3}{x^2+x-1} dx$

Evaluate each indefinite integral.

1. $\int \cos(2x + 5) dx$

2. $\int \ln x dx$

3. $\int x e^x dx$

4. $\int \frac{1}{(x+3)(x-2)} dx$

5. $\int x \cos^2 x dx$

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

7. $\int (x+5)(x^3+5x-7) dx$

8. $\int \frac{\sin^2 x}{\cos x} dx$

9. $\int \csc^4 x \cot x dx$

10. $\int \cot x dx$