

Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Trigonometric Integration

Apply the matching trigonometric antiderivative rule, adjust for the constant derivative of the argument, and include + C.

1. $\int -3 \cdot \sec(x)^2 dx$

6. $\int -2 \cdot \sin(x) dx$

2. $\int -1 \cdot \sec(x) \cdot \tan(x) dx$

7. $\int \frac{-3}{2} \cdot \sec(-2 \cdot x) \cdot \tan(-2 \cdot x) dx$

3. $\int -2 \cdot \cos(x) dx$

8. $\int \frac{2}{3} \cdot \sec(-3 + x)^2 dx$

4. $\int -1 \cdot \csc(x)^2 dx$

9. $\int -1 \cdot \cos(3 - 3 \cdot x) dx$

5. $\int \frac{-2}{3} \cdot \csc(x) \cdot \cot(x) dx$

10. $\int -3 \cdot \csc(-3 - x)^2 dx$

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Trigonometric Integration

Worked Answer Key

Apply the matching trigonometric antiderivative rule, adjust for the constant derivative of the argument, and include + C.

1. Original: $\int -3 \cdot \sec(x)^2 dx$

Pattern: $d/dx \tan(x) = \sec(x)^2$

Coefficient: $-3 / 1 = -3$

Result: $-3 \cdot \tan(x) + C$

Original domain: $\cos(x) \neq 0$

On each open domain component; constants may differ on disconnected components.

2. Original: $\int -1 \cdot \sec(x) \cdot \tan(x) dx$

Pattern: $d/dx \sec(x) = \sec(x) \cdot \tan(x)$

Coefficient: $-1 / 1 = -1$

Result: $-\sec(x) + C$

Original domain: $\cos(x) \neq 0$

On each open domain component; constants may differ on disconnected components.

3. Original: $\int -2 \cdot \cos(x) dx$

Pattern: $d/dx \sin(x) = \cos(x)$

Coefficient: $-2 / 1 = -2$

Result: $-2 \cdot \sin(x) + C$

Original domain: all real x.

On each open domain component; constants may differ on disconnected components.

4. Original: $\int -1 \cdot \csc(x)^2 dx$

Pattern: $d/dx \cot(x) = -1 \cdot \csc(x)^2$

Coefficient: $-1 / -1 = 1$

Result: $\cot(x) + C$

Original domain: $\sin(x) \neq 0$

On each open domain component; constants may differ on disconnected components.

5. Original: $\int \frac{-2}{3} \cdot \csc(x) \cdot \cot(x) dx$

Pattern: $d/dx \csc(x) = -1 \cdot \csc(x) \cdot \cot(x)$

Coefficient: $\frac{-2}{3} / -1 = \frac{2}{3}$

Result: $\frac{2}{3} \cdot \csc(x) + C$

Original domain: $\sin(x) \neq 0$

On each open domain component; constants may differ on disconnected components.

6. Original: $\int -2 \cdot \sin(x) dx$

Pattern: $d/dx \cos(x) = -1 \cdot \sin(x)$

Coefficient: $-2 / -1 = 2$

Result: $2 \cdot \cos(x) + C$

Original domain: all real x.

On each open domain component; constants may differ on disconnected components.

7. Original: $\int \frac{-3}{2} \cdot \sec(-2 \cdot x) \cdot \tan(-2 \cdot x) dx$

Pattern: $d/dx \sec(-2 \cdot x) = -2 \cdot \sec(-2 \cdot x) \cdot \tan(-2 \cdot x)$

Coefficient: $\frac{-3}{2} / -2 = \frac{3}{4}$

Result: $\frac{3}{4} \cdot \sec(-2 \cdot x) + C$

Original domain: $\cos(-2 \cdot x) \neq 0$

On each open domain component; constants may differ on disconnected components.

Trigonometric Integration

Worked Answer Key

Apply the matching trigonometric antiderivative rule, adjust for the constant derivative of the argument, and include + C.

8. Original: $\int \frac{2}{3} \cdot \sec(-3 + x)^2 dx$

Pattern: $d/dx \tan(-3 + x) = \sec(-3 + x)^2$

Coefficient: $\frac{2}{3} / 1 = \frac{2}{3}$

Result: $\frac{2}{3} \cdot \tan(-3 + x) + C$

Original domain: $\cos(-3 + x) \neq 0$

On each open domain component; constants may differ on disconnected components.

9. Original: $\int -1 \cdot \cos(3 - 3 \cdot x) dx$

Pattern: $d/dx \sin(3 - 3 \cdot x) = -3 \cdot \cos(3 - 3 \cdot x)$

Coefficient: $-1 / -3 = \frac{1}{3}$

Result: $\frac{1}{3} \cdot \sin(3 - 3 \cdot x) + C$

Original domain: all real x.

On each open domain component; constants may differ on disconnected components.

10. Original: $\int -3 \cdot \csc(-3 - x)^2 dx$

Pattern: $d/dx \cot(-3 - x) = \csc(-3 - x)^2$

Coefficient: $-3 / 1 = -3$

Result: $-3 \cdot \cot(-3 - x) + C$

Original domain: $\sin(-3 - x) \neq 0$

On each open domain component; constants may differ on disconnected components.