

Daily Quiz

- Go to [Socrative.com](https://www.socrative.com) and complete the quiz.
- Room Name: HONG5824
- Use your full name.

You see a square root. What now?

$$\int \frac{1}{t\sqrt{t^2-1}} dt \qquad \int \frac{1}{\sqrt{4+x^2}} dx \qquad \int \frac{1}{x^2\sqrt{1-4x^2}} dx$$

We look at Pythagorean trig identities for help.

The goal is to **eliminate the square root** by using a scaled trig identity.

$$1 - \cos^2 \theta = \sin^2 \theta \quad \rightarrow \quad r^2 - r^2 \cos^2 \theta = r^2 \sin^2 \theta$$

$$1 + \tan^2 \theta = \sec^2 \theta \quad \rightarrow \quad r^2 + r^2 \tan^2 \theta = r^2 \sec^2 \theta$$

$$\sec^2 \theta - 1 = \tan^2 \theta \quad \rightarrow \quad r^2 \sec^2 \theta - r^2 = r^2 \tan^2 \theta$$

5.7 Trigonometric Substitution

$$\int \frac{1}{t\sqrt{t^2 - 1}} dt$$

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

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

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$$\int \frac{1}{\sqrt{4+x^2}} dx$$

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5.7 Trigonometric Substitution (Completing the Square)

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

5.7 Trigonometric Substitution (Completing the Square)

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5.7 Trigonometric Integrals

Prove that the area of a circle with radius r is πr^2 .

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