Year 2 – Reciprocal Trigonometric Functions

Name:

Key Facts

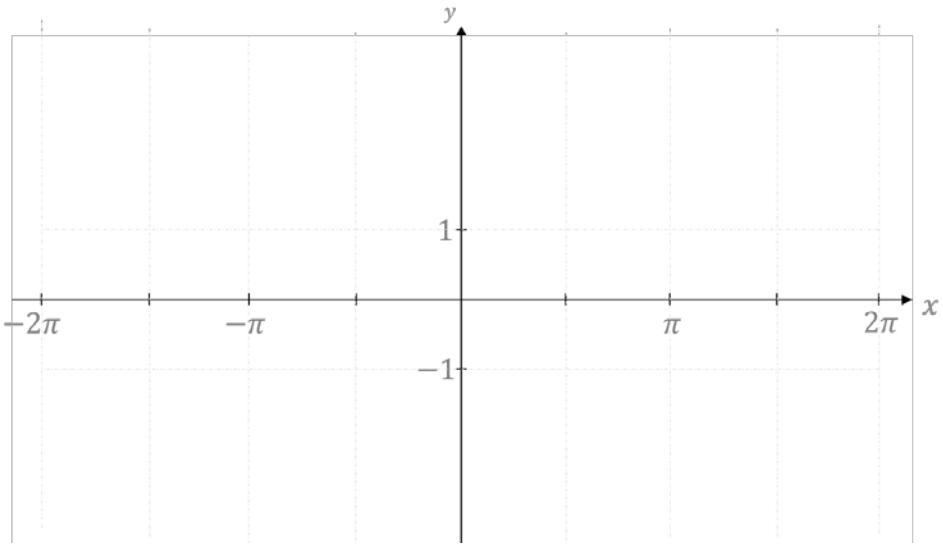
$$\sec x = \frac{1}{\cos x} \qquad \operatorname{cosec} x = \frac{1}{\sin x} \qquad \cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x}$$

Top tip

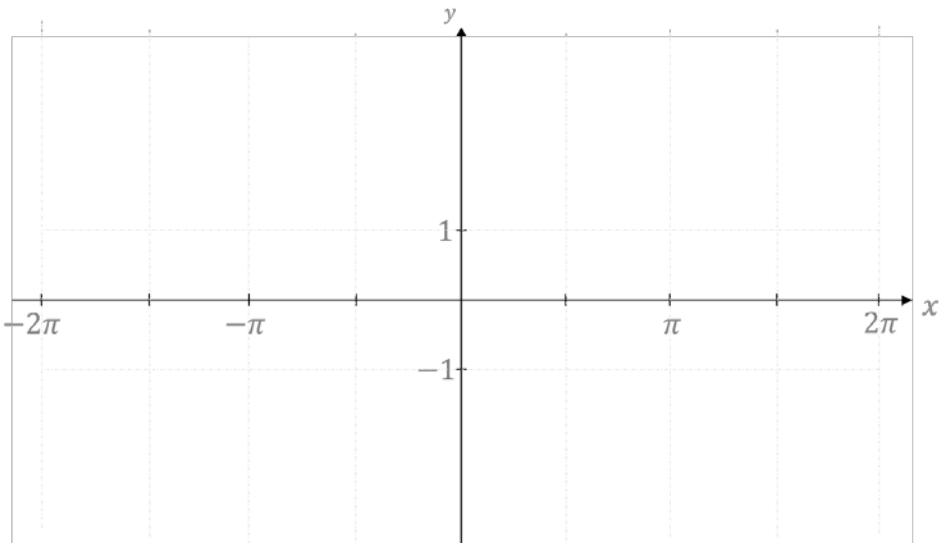
Use the third letter of each reciprocal function the help remember these.

The Graphs

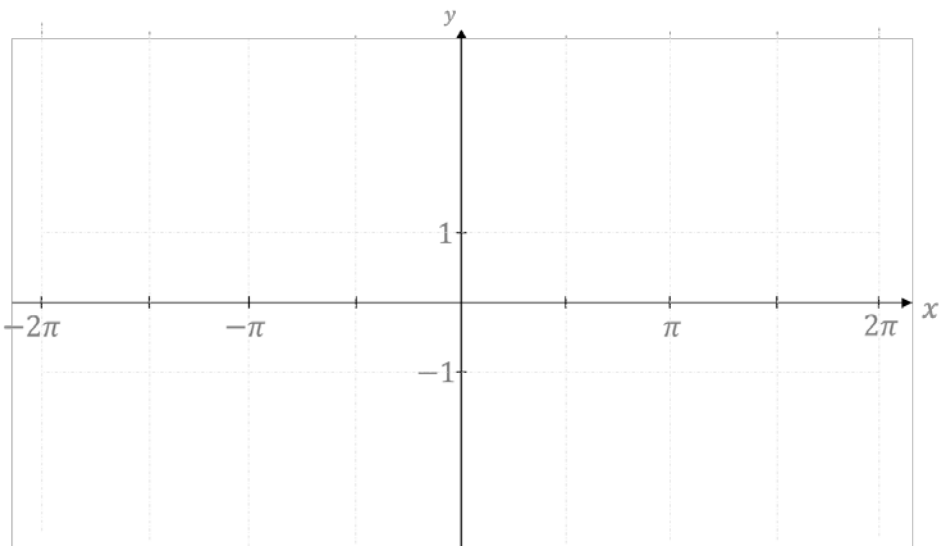
$y = \sec x$



$y = \operatorname{cosec} x$



$y = \cot x$



1E Solve the equation $2\sec x + 1 = 6$, giving all values of x in the interval $0 \leq x \leq 2\pi$.

Give your answers in radians to 2 decimal places.

1P Solve the equation $3\sec x - 2 = -10$, giving all values of x in the interval $-180° \leq x \leq 180°$.

Give your answers to the nearest degree.

2E Solve the equation $\text{cosec}(2\theta) = 4$, giving all values of θ in the interval $0 \leq \theta \leq 360°$.

Give your answers in degrees to three significant figures.

2P Solve the equation $\text{cosec}(2\theta\ ) = 1.6$, giving all values of θ in the interval $0 \leq \theta \leq 2\pi$.

Give your answers in radians to two significant figures.

3E Find the exact solutions to the equation

$$\cot\left(2\phi - \frac{\pi}{3}\right) = \sqrt{3},$$

giving all values of ϕ in the interval $0 \leq \phi \leq 2\pi$.

3P Find the exact solutions to the equation

$$\cot\left(2\phi + \frac{\pi}{6}\right) = 1,$$

giving all values of ϕ in the interval $0 \leq \phi \leq 2\pi$.