

# Trig 12 Answers

Trig identities - Answers (p.23)

$$\frac{\sin x}{\cos x} = \tan x$$

$$\sin^2 x + \cos^2 x = 1$$

1a)  $3\cos^2 x + 3\sin^2 x$

$$= 3(\cos^2 x + \sin^2 x)$$

$$= 3$$

b)  $1 - \cos^2 x$

$$= \sin^2 x$$

c)  $\cos A \tan A$

$$= \cos A \times \frac{\sin A}{\cos A}$$

$$= \sin A$$

d)  $5 - 5\sin^2 B^\circ$

$$= 5(1 - \sin^2 B^\circ)$$

$$= 5\cos^2 B^\circ$$

e)  $\frac{4 \sin a^\circ}{4 \cos a^\circ}$

$$= \tan a^\circ$$

f)  $\frac{4 \tan x}{2 \cos x}$

$$= \frac{2 \tan x}{\cos x}$$

g)  $\frac{1 - \sin^2 x}{2 \cos x}$

$$= \frac{\cos^2 x}{2 \cos x}$$

$$= \frac{\cos x}{2}$$

h)  $\frac{8 - 8 \cos^2 x}{2 \sin x}$

$$= \frac{8(1 - \cos^2 x)}{2 \sin x}$$

$$= \frac{4 \sin^2 x}{\sin x}$$

$$= 4 \sin x$$

i)  $\frac{3 \sin x \cos x}{6 \tan x}$

$$= \sin x \cos x \div \frac{2 \sin x}{\cos x}$$

$$= \sin x \cos x \times \frac{\cos x}{2 \sin x}$$

$$= \frac{\cos^2 x}{2}$$

j)  $4 \sin^2 A + 3 \cos^2 A - 3$

$$= 4 \sin^2 A + 3(\cos^2 A - 1)$$

$$= 4 \sin^2 A - 3 \sin^2 A$$

$$= \sin^2 A$$

k)  $4 \cos^2 B - 2 \sin^2 B + 2$

$$= 4 \cos^2 B - 2(\sin^2 B - 1)$$

$$= 4 \cos^2 B + 2 \cos^2 B$$

$$= 6 \cos^2 B$$

l)  $(\cos x + \sin x)^2 - 2 \sin x \cos x$

$$= \cos^2 x + 2 \sin x \cos x + \sin^2 x - 2 \sin x \cos x$$

$$= 1$$

m)  $\tan^2 a (1 - \sin^2 a)$

$$= \frac{\sin^2 a}{\cos^2 a} (\cos^2 a)$$

$$= \sin^2 a$$

Trig 12 Answers

$$\tan x = \frac{\sin x}{\cos x} \quad \sin^2 x + \cos^2 x = 1$$

$$\begin{aligned} 2a) \quad & 2\cos^2 A + 3\sin^2 A \\ &= 2\cos^2 A + 3(1 - \cos^2 A) \\ &= 2\cos^2 A + 3 - 3\cos^2 A \\ &= \underline{3 - \cos^2 A} \\ &= \end{aligned}$$

$$\begin{aligned} b) \quad & \frac{1}{\tan x} + \tan x \\ &= \frac{\cos x}{\sin x} + \frac{\sin x}{\cos x} \\ &= \frac{\cos^2 x}{\sin x \cos x} + \frac{\sin^2 x}{\sin x \cos x} \\ &= \frac{\cos^2 x + \sin^2 x}{\sin x \cos x} \\ &= \frac{1}{\sin x \cos x} \\ &= \end{aligned}$$

$$\begin{aligned} c) \quad & (2\cos B + 3\sin B)^2 + (3\cos B - 2\sin B)^2 \\ &= 4\cos^2 B + 12\sin B \cos B + 9\sin^2 B + 9\cos^2 B - 12\sin B \cos B + 4\sin^2 B \\ &= 4(\cos^2 B + \sin^2 B) + 9(\sin^2 B + \cos^2 B) \\ &= 4 + 9 = \underline{13} \end{aligned}$$

$$\begin{aligned} d) \quad & (1 + \sin x)(1 - \sin x) \\ &= 1 + \sin x - \sin x - \sin^2 x \\ &= 1 - \sin^2 x \\ &= \underline{\cos^2 x} \\ &= \end{aligned}$$

$$\begin{aligned} e) \quad & \sin \theta \tan \theta \\ &= \sin \theta \times \frac{\sin \theta}{\cos \theta} \\ &= \frac{\sin^2 \theta}{\cos \theta} \\ &= \frac{1 - \cos^2 \theta}{\cos \theta} \\ &= \end{aligned}$$