

5.5 Double and Half Angle Identities

(Part 1)

The double angle identities:

$$\sin 2x = 2 \sin x \cos x$$

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

$$= 2 \cos^2 x - 1$$

$$= 1 - 2 \sin^2 x$$

To show that $\sin 2x = 2 \sin x \cos x$

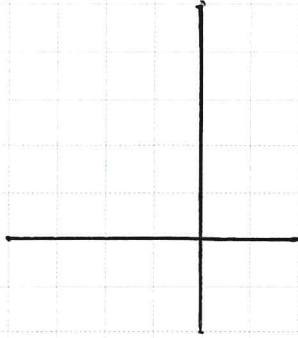
Consider that: $\sin(2x) =$

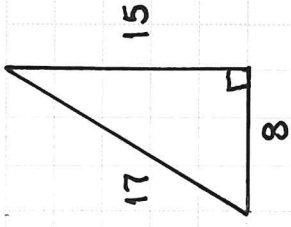
$$\tan 2x = \frac{2 \tan x}{1 - \tan^2 x}$$

Likewise: $\cos(2x) =$

Ex. ① Given: $\sin u = \frac{3}{5}$ and $\cos u > 0$

Find: $\sin 2u$, $\cos 2u$ and $\tan 2u$
without finding u .





Ex. ② Use the figure to find the exact values of:

a) $\sin 2\theta$

b) $\sec 2\theta$

c) $\tan 2\theta$

Ex. ③ Solve: $\sin 2x + \cos x = 0$ on $[0, 2\pi)$

Ex. ④ Solve: $\cos 2x - \cos x = 0$ on $[0, 2\pi)$