

Exercise 7B

Question 16:

$$\cos \theta + \sin \theta = \sqrt{2} \sin \theta$$
(squaring both side we get)
$$\Rightarrow (\cos \theta \sin \theta)^2 = (\sqrt{2} \sin \theta)^2$$

$$\Rightarrow \cos^2 \theta + \sin^2 \theta + 2\cos \theta \sin \theta = 2\sin^2 \theta$$

$$\sin^2 \theta = 2\cos \theta \sin \theta + \cos^2$$

$$\sin^2 \theta - \cos^2 \theta = 2\cos \theta \sin \theta$$
(sin θ + cos θ)(sin θ - cos θ) = 2 sin θ cos θ
($\sqrt{2} \sin \theta$)(sin θ - cos θ) = 2 sin θ cos θ
(sin θ cos θ) = $\sqrt{2} \cos \theta$
Hence, (sin θ - cos θ) = $\sqrt{2} \cos \theta$

Question 17:

LHS =
$$\frac{a \sin \theta - b \cos \theta}{a \sin \theta + b \cos \theta}$$
LHS =
$$\frac{a \tan \theta - b}{a \tan \theta + b}$$
=
$$\frac{a \times \frac{a}{b} - b}{a \times \frac{a}{b} + b} = \frac{\left(\frac{a^2 - b^2}{b}\right)}{\left(\frac{a^2 + b^2}{b}\right)} = \frac{a^2 - b^2}{a^2 + b^2} = RHS$$

:: LHS = RHS

********* END *******