

Trigonometry – 2021 AS

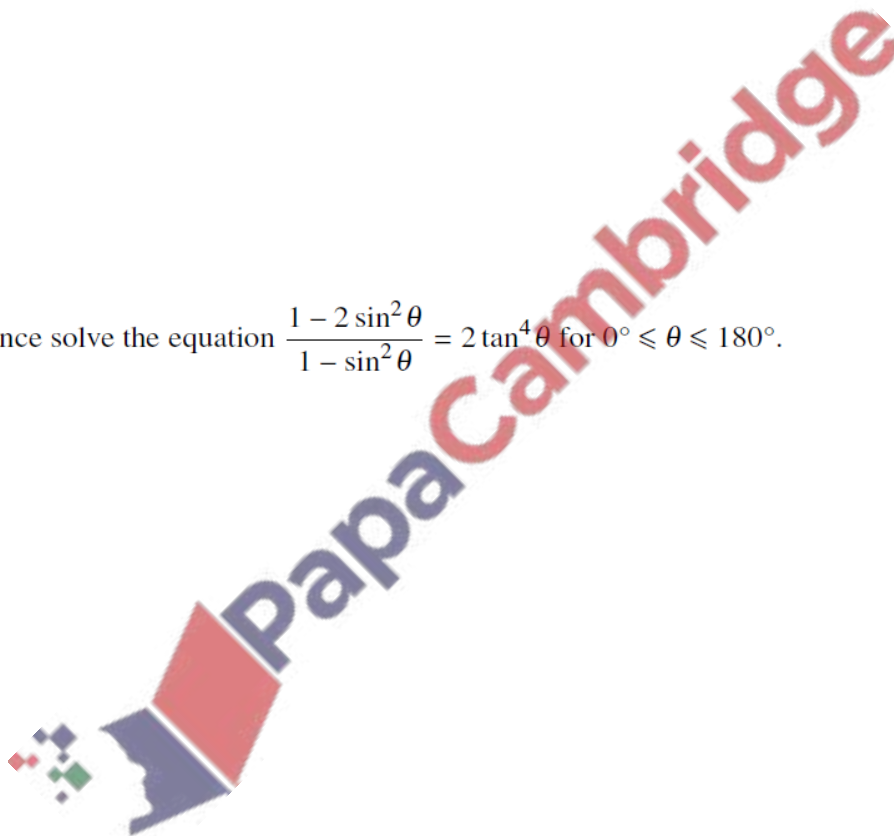
1. June/2021/Paper_9709/11/No.7

(a) Prove the identity $\frac{1 - 2 \sin^2 \theta}{1 - \sin^2 \theta} \equiv 1 - \tan^2 \theta$.

[2]

(b) Hence solve the equation $\frac{1 - 2 \sin^2 \theta}{1 - \sin^2 \theta} = 2 \tan^4 \theta$ for $0^\circ \leq \theta \leq 180^\circ$.

[3]



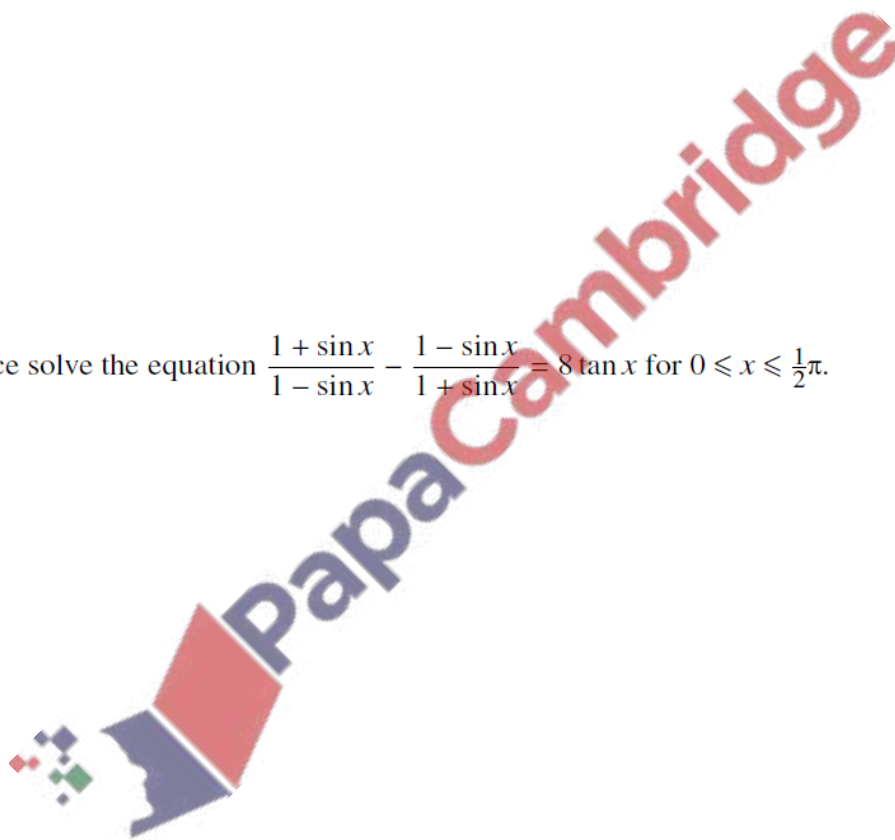
2. June/2021/Paper_9709/12/No.10

(a) Prove the identity $\frac{1 + \sin x}{1 - \sin x} - \frac{1 - \sin x}{1 + \sin x} \equiv \frac{4 \tan x}{\cos x}$.

[4]

(b) Hence solve the equation $\frac{1 + \sin x}{1 - \sin x} - \frac{1 - \sin x}{1 + \sin x} = 8 \tan x$ for $0 \leq x \leq \frac{1}{2}\pi$.

[3]



3. June/2021/Paper_9709/13/No.4

(a) Show that the equation

$$\frac{\tan x + \sin x}{\tan x - \sin x} = k,$$

where k is a constant, may be expressed as

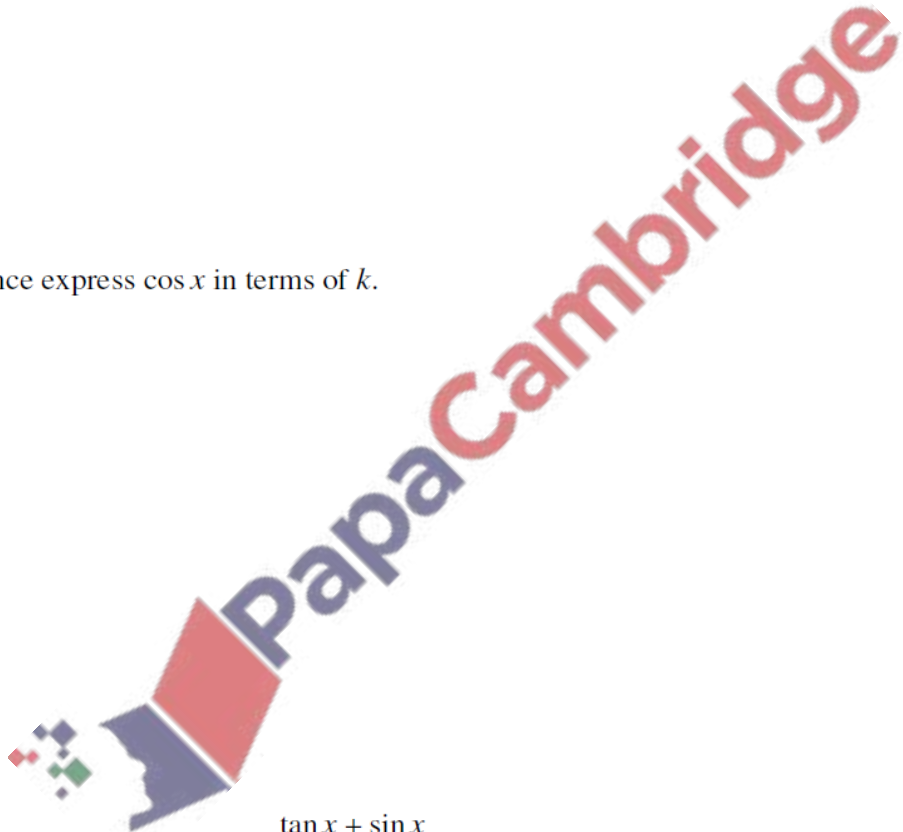
$$\frac{1 + \cos x}{1 - \cos x} = k. \quad [2]$$

(b) Hence express $\cos x$ in terms of k .

[2]

(c) Hence solve the equation $\frac{\tan x + \sin x}{\tan x - \sin x} = 4$ for $-\pi < x < \pi$.

[2]



4. March/2021/Paper_9709/12/No.3

Solve the equation $\frac{\tan \theta + 2 \sin \theta}{\tan \theta - 2 \sin \theta} = 3$ for $0^\circ < \theta < 180^\circ$.

[4]

