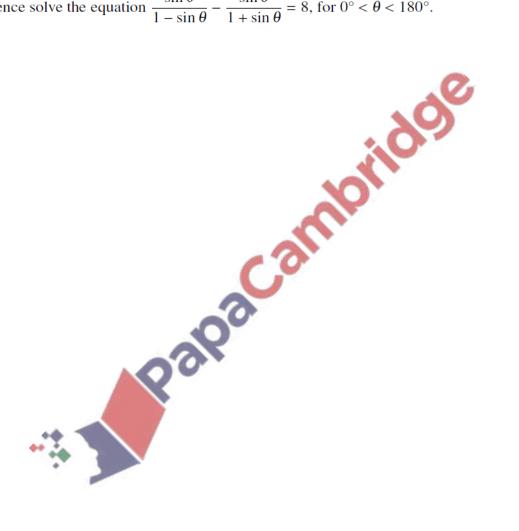
## <u>Trigonometry - 2020 AS</u>

1. Nov/2020/Paper\_9709/11/No.7

(a) Show that 
$$\frac{\sin \theta}{1 - \sin \theta} - \frac{\sin \theta}{1 + \sin \theta} = 2 \tan^2 \theta$$
. [3]

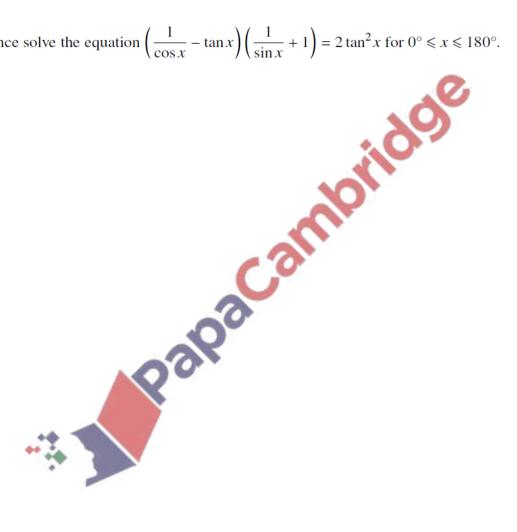
**(b)** Hence solve the equation 
$$\frac{\sin \theta}{1 - \sin \theta} - \frac{\sin \theta}{1 + \sin \theta} = 8$$
, for  $0^{\circ} < \theta < 180^{\circ}$ . [3]



## Nov/2020/Paper\_9709/12/No.6

(a) Prove the identity 
$$\left(\frac{1}{\cos x} - \tan x\right) \left(\frac{1}{\sin x} + 1\right) = \frac{1}{\tan x}$$
. [4]

**(b)** Hence solve the equation 
$$\left(\frac{1}{\cos x} - \tan x\right) \left(\frac{1}{\sin x} + 1\right) = 2 \tan^2 x$$
 for  $0^\circ \le x \le 180^\circ$ . [2]



## **3.** Nov/2020/Paper\_9709/13/No.3

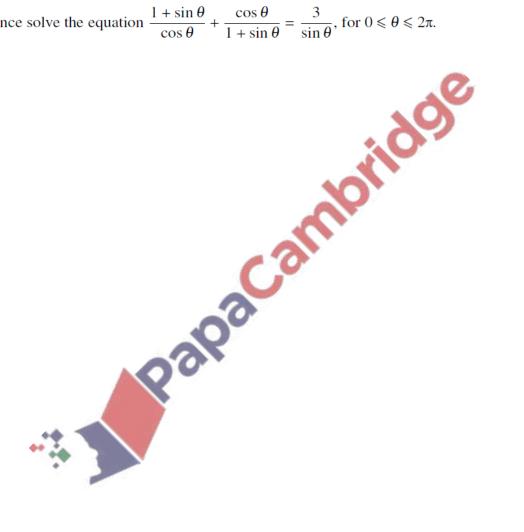
Solve the equation  $3 \tan^2 \theta + 1 = \frac{2}{\tan^2 \theta}$  for  $0^\circ < \theta < 180^\circ$ . [5]



June/2020/Paper\_9709/11/No.7

(a) Prove the identity 
$$\frac{1+\sin\theta}{\cos\theta} + \frac{\cos\theta}{1+\sin\theta} = \frac{2}{\cos\theta}$$
. [3]

**(b)** Hence solve the equation 
$$\frac{1+\sin\theta}{\cos\theta} + \frac{\cos\theta}{1+\sin\theta} = \frac{3}{\sin\theta}$$
, for  $0 \le \theta \le 2\pi$ . [3]



- **5.** June/2020/Paper\_9709/12/No.2
  - (a) Express the equation  $3\cos\theta = 8\tan\theta$  as a quadratic equation in  $\sin\theta$ .

[3]

[2]

**(b)** Hence find the acute angle, in degrees, for which  $3 \cos \theta = 8 \tan \theta$ .

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6. June/2020/Paper\_9709/13/No.7

(a) Show that 
$$\frac{\tan \theta}{1 + \cos \theta} + \frac{\tan \theta}{1 - \cos \theta} = \frac{2}{\sin \theta \cos \theta}$$
. [4]

**(b)** Hence solve the equation 
$$\frac{\tan \theta}{1 + \cos \theta} + \frac{\tan \theta}{1 - \cos \theta} = \frac{6}{\tan \theta}$$
 for  $0^{\circ} < \theta < 180^{\circ}$ . [4]

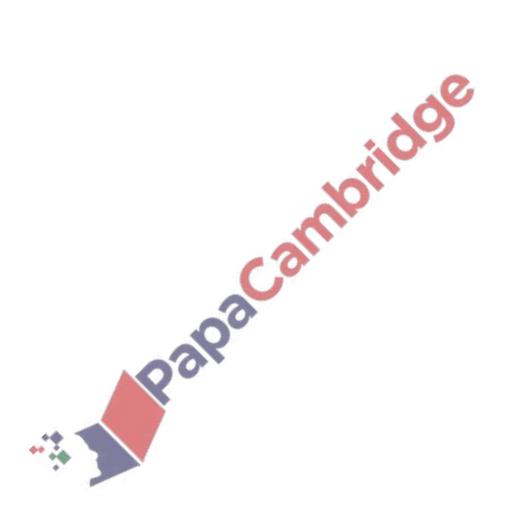


## **7.** March/2020/Paper\_9709/12/No.5

Solve the equation

$$\frac{\tan\theta + 3\sin\theta + 2}{\tan\theta - 3\sin\theta + 1} = 2$$

for  $0^{\circ} \leqslant \theta \leqslant 90^{\circ}$ . [5]



**8.** March/2020/Paper\_9709/12/No.11

(a) Solve the equation  $3\tan^2 x - 5\tan x - 2 = 0$  for  $0^\circ \le x \le 180^\circ$ . [4]

(b) Find the set of values of k for which the equation  $3 \tan^2 x - 5 \tan x + k = 0$  has no solutions. [2]

(c) For the equation  $3 \tan^2 x - 5 \tan x + k = 0$ , state the value of k for which there are three solutions in the interval  $0^\circ \le x \le 180^\circ$ , and find these solutions. [3]