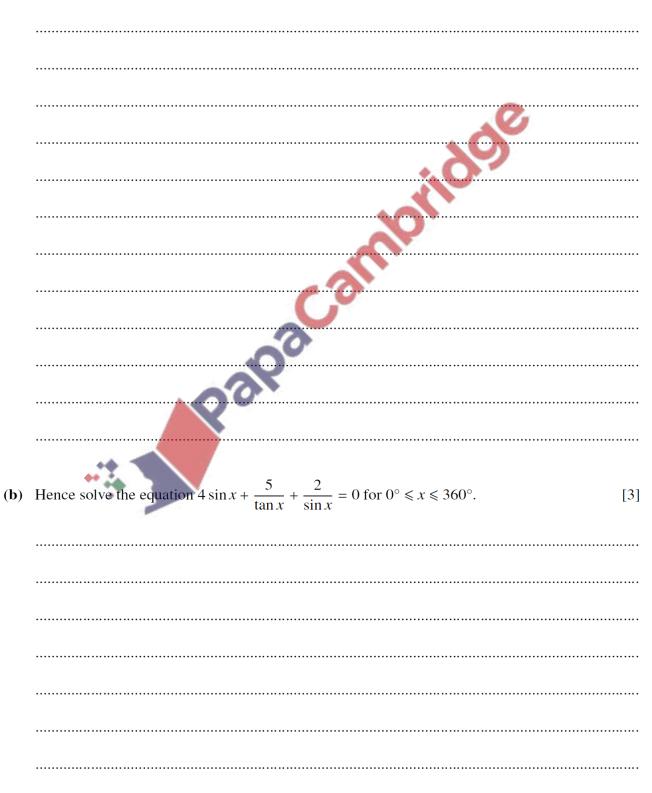
## Trigonometry – 2023 AS Mathematics 9709

## 1. Nov/2023/Paper\_9709/11/No.5

(a) Show that the equation

$$4\sin x + \frac{5}{\tan x} + \frac{2}{\sin x} = 0$$

may be expressed in the form  $a \cos^2 x + b \cos x + c = 0$ , where *a*, *b* and *c* are integers to be found. [3]



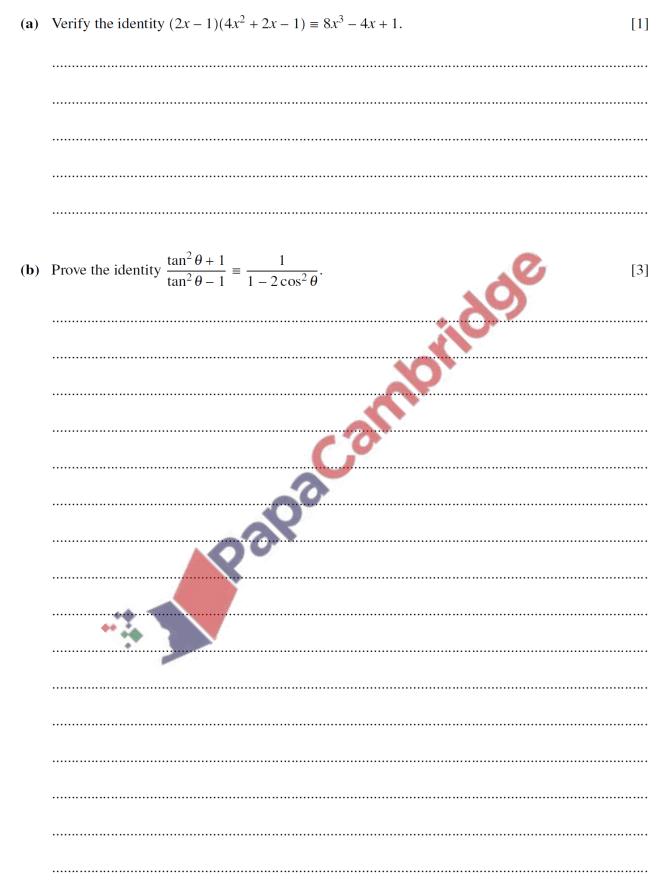
## **2.** Nov/2023/Paper\_9709/12/No.2

Find the exact solution of the equation

$$\frac{1}{6}\pi + \tan^{-1}(4x) = -\cos^{-1}\left(\frac{1}{2}\sqrt{3}\right).$$
[2]



3. Nov/2023/Paper\_9709/12/No.7



(c) Using the results of (a) and (b), solve the equation

 $\frac{\tan^2\theta + 1}{\tan^2\theta - 1} = 4\cos\theta,$ for  $0^{\circ} \leq \theta \leq 180^{\circ}$ . [5] ..... . . . . . ...... ..... .... ..... ..... 4 -----..... ..... .....

# **4.** Nov/2023/Paper\_9709/13/No.3

(a) Show that the equation

1	
f	may be expressed in the form $a \cos^2 \theta + b \cos \theta + c = 0$ , where <i>a</i> , <i>b</i> and <i>c</i> are constants to found.
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	63
F	Hence solve the equation $5 \cos \theta - \sin \theta \tan \theta + 1 = 0$ for $0 < \theta < 2\pi$ .
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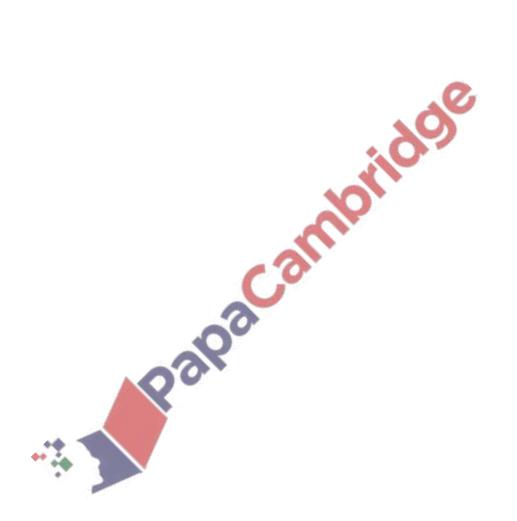
#### 5. March/2023/Paper\_9709/12/No.7

(a) By first obtaining a quadratic equation in  $\cos \theta$ , solve the equation

 $\tan\theta\sin\theta = 1$ 

for  $0^{\circ} < \theta < 360^{\circ}$ .

[5]



**(b)** Show that  $\frac{\tan \theta}{\sin \theta} - \frac{\sin \theta}{\tan \theta} \equiv \tan \theta \sin \theta$ .

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