Trigonometry – 2021 A2

1. June/2021/Paper_9709/21/No.2

By first expanding $\sin(\theta + 30°)$, solve the equation $\sin(\theta + 30°)\operatorname{cosec}\theta = 2$ for $0° < \theta < 360°$. [6]

2. June/2021/Paper_9709/22/No.3

Solve the equation $\sin(2\theta + 30°) = 5\cos(2\theta + 60°)$ for $0° < \theta < 180°$. [6]

3. March/2021/Paper_9709/22/No.2

Solve the equation $\sec^2\theta \cot\theta = 8$ for $0 < \theta < \pi$. [5]

4. March/2021/Paper_9709/22/No.7a,7b

(a) Express $5\sqrt{3}\cos x + 5\sin x$ in the form $R\cos(x - \alpha)$, where $R > 0$ and $0 < \alpha < \frac{1}{2}\pi$. [3]

(b) As x varies, find the least possible value of

$$4 + 5\sqrt{3}\cos x + 5\sin x,$$

and determine the corresponding value of x where $-\pi < x < \pi$. [3]