MEMORANDUM

Name: ..... Class: .....

Date: .....

MARK ____ / 22

Answer all questions. Show all your working — marks are awarded for method as well as the final answer. **Teacher copy: accept any correct equivalent method.**

1 Determine the general solution of $\sin\theta = 0{,}5$ **(3)**

> $\theta = 30° + k\cdot 360°$ **or** $\theta = 150° + k\cdot 360°, k \in \mathbb{Z}$ ✓✓✓ (3)

2 Determine the general solution of $\cos\theta = -0{,}5$ **(3)**

> ref $= 60°$, cos negative in QII and QIII $\rightarrow \theta = \pm 120° + k\cdot 360°, k \in \mathbb{Z}$ ✓✓✓ (3)

3 Determine the general solution of $\tan\theta = \sqrt{3}$ **(2)**

> $\theta = 60° + k\cdot 180°, k \in \mathbb{Z}$ ✓✓ (2)

4 Solve $\sin\theta = 0{,}5$ for $\theta \in [0° ; 360°]$ **(2)**

> $\theta = 30°$ **or** $\theta = 150°$ ✓✓ (2)

5 Solve $\cos\theta = 0{,}7660$ for $\theta \in [0° ; 360°]$ (round to one decimal) **(3)**

> ref $= 40{,}0° \rightarrow \theta = 40{,}0°$ **or** $\theta = 320{,}0°$ ✓✓✓ (3)

6 Determine the general solution of $\tan(2x - 30°) = 1$ **(3)**

> $2x - 30° = 45° + k\cdot 180° \rightarrow x = 37{,}5° + k\cdot 90°, k \in \mathbb{Z}$ ✓✓✓ (3)

7 State the reference angle for $\sin\theta = 0{,}8660$. **(1)**

> ref $= \sin^{-1}(0{,}8660) = 60°$ (to the nearest degree) ✓ (1)

8 Determine the general solution of $\sin 2\theta = \cos\theta$. **(4)**

> $\cos\theta = \sin(90° - \theta)$, so $\sin 2\theta = \sin(90° - \theta)$ *(1)*
> $2\theta = 90° - \theta + k\cdot 360° \Rightarrow 3\theta = 90° + k\cdot 360° \Rightarrow \theta = 30° + k\cdot 120°$ *(1)*
> or $2\theta = 180° - (90° - \theta) + k\cdot 360° \Rightarrow \theta = 90° + k\cdot 360°$ *(1)*
> $\theta = 30° + k\cdot 120°$ **or** $\theta = 90° + k\cdot 360°, k \in \mathbb{Z}$ *(1)* ✓✓✓✓ (4)

9 Why must $k \in \mathbb{Z}$ be written down? **(1)**

It states that the pattern repeats for every integer k — **without it the solution is incomplete and loses a mark**. ✓ (1)

TOTAL: 22 marks

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