» Graphing; Trigonometric Equations & Identities | Diagnostic Quiz

1. Determine the equations of any asymptotes for the curve $y = \frac{x^2+6x+1}{x+1}$. **3**

2. Graph the following, labelling all features clearly:

    a. $y = 3 - 2\cos x$ within the domain $-180° \leq x \leq 360°$ **4**

    b. $y = \frac{1}{x^2} - x$ **4**

    c. $y = \frac{2x+1}{(x+2)(2x-3)}$ **4**

3. Consider two graphs, given by the equations $f(x) = \sqrt{25 - (x+5)^2}$ and $g(x) = 10 - f(x)$.

    a. State the domain and range for:

        i. $f(x)$ **2**

        ii. $g(x)$ **2**

    b. Hence or otherwise graph $f(x)$ and $g(x)$, showing all intercepts and marking in the point where the two graphs intersect. **4**

4. State the exact values of:

    a. $\sin 60° \times \tan 60°$ **2**

    b. $\cos 45° \times \operatorname{cosec} 30°$ **2**

    c. $\sin 210°$ **2**

    d. $\cot 330°$ **2**

5. Prove the following trigonometric identities:

    a. $\sin x \cos x = \frac{\tan x}{1+\tan^2 x}$ **2**

    b. $(\cot \theta + \operatorname{cosec} \theta)^2 = \frac{1+\cos\theta}{1-\cos\theta}$ **3**

    c. $\frac{\sin A + \sin B}{\cos A + \cos B} + \frac{\sin A - \sin B}{\cos A - \cos B} = 0$ **2**

6. Solve the following trigonometric equations, giving answers to the nearest minute:

    a. $\sin^2 x = 1 \ \{0° \leq x \leq 720°\}$ **4**

    b. $\cos x = \frac{-1}{4} \ \{-180° \leq x \leq 180°\}$ **4**

    c. $\cos x - \sqrt{3}\sin x = 0 \ \{0° \leq x \leq 360°\}$ **4**

    d. $8\cos^2 x = 2\sin x + 7 \ \{0° \leq x \leq 360°\}$ **6**