3. Given $f(x) = \frac{2x+1}{x}, x \neq 0$ and $fg(x) = x - 2$. Determine the formula of $g(x)$. [3]

4. Given $g(x) = x + 1$ and $fg(x) = x^2 + 3x + 2$. Determine the formula of $f(x)$. [3]

5. Fill in the blank.
   a. $\sin(-20)° = \sin(\quad)° = \sin(\quad)°$, for $0 \leq x \leq 360$ [2]
   b. $\cos(-120)° = \cos(\quad)° = \cos(\quad)°$, for $0 \leq x \leq 360$ [2]
   c. $\tan(1200)° = \tan(\quad)° = \tan(\quad)°$, for $-180 \leq x \leq 180$ [2]

6. Find the **maximum and the minimum value** of the following functions. In each case, give the **smallest positive values of x** at which they occur.
   a. $y = 10 + 2\cos x$ [4]
   b. $y = \frac{24}{10 - 2\sin(2x+30)°}$ [6]

7. Given $\cos A = \frac{3}{5}$ and $\sin A$ is negative. Find the value of:
   a. $\tan A$ [2]
   b. smallest positive value of A [1]

8. Find all the values of θ.

a. $\sin 2\theta° = -0.643$ for $0 \leq \theta \leq 180$ and give your answers correct to 1 decimal place. [4]

b. $\cos\frac{3}{2}\theta° = -0.643$ for $-\pi \leq \theta \leq \pi$ and give your answers correct to 2 decimal places. [6]

9. i. Show that equation $\sin^2\theta = 2\cos\theta$ can be written in the form $\cos^2\theta + 2\cos\theta - 1 = 0$. [1]

ii. Hence solve the equation $\sin^2\theta = 2\cos\theta$, for $-\pi \leq \theta \leq \pi$ and give your answers correct to 2 decimal places. [3]

10. Prove the following identities.

a. $1 - 3\sin^2\theta \equiv 3\cos^2\theta - 2$ [2]

b. $\frac{\tan}{1-\tan^2\theta} \equiv \frac{\sin\theta\cos\theta}{\cos^2\theta - \sin^2\theta}$ [3]