C3 **TRIGONOMETRY** *Worksheet B*

1 $f(x) \equiv \sin x, \ x \in \mathbb{R}, \ -\frac{\pi}{2} \le x \le \frac{\pi}{2}.$

   a State the range of f.

   b Define the inverse function $f^{-1}(x)$ and state its domain.

   c Sketch on the same diagram the graphs of $y = f(x)$ and $y = f^{-1}(x)$.

2 Find, in radians in terms of π, the value of

   a arcsin 0   **b** arcsin $\frac{1}{\sqrt{2}}$ **c** arcsin (−1)   **d** arcsin $(-\frac{\sqrt{3}}{2})$

3 $g(x) \equiv \cos x, \ x \in \mathbb{R}, 0 \le x \le \pi.$

   a Define the inverse function $g^{-1}(x)$ and state its domain.

   b Sketch on the same diagram the graphs of $y = g(x)$ and $y = g^{-1}(x)$.

4 $h(x) \equiv \tan x, \ x \in \mathbb{R}, \ -\frac{\pi}{2} < x < \frac{\pi}{2}.$

   a Define the inverse function $h^{-1}(x)$ and state its domain.

   b Sketch on the same diagram the graphs of $y = h(x)$ and $y = h^{-1}(x)$.

5 Find, in radians in terms of π, the value of

   a arccos 1   **b** arctan $\sqrt{3}$ **c** arccos $\frac{\sqrt{3}}{2}$ **d** arcsin $(-\frac{1}{2})$

   e arctan (−1)   **f** arccos (−1)   **g** arctan $(-\frac{1}{\sqrt{3}})$ **h** arccos $(-\frac{1}{\sqrt{2}})$

6 Find, in radians to 2 decimal places, the value of

   a arcsin 0.6   **b** arccos 0.152   **c** arctan 4.7   **d** arcsin (−0.38)

   e arccos 0.92   **f** arctan (−0.46)   **g** arcsin (−0.506)   **h** arccos (−0.75)

7 Solve

   a arcsin $x = \frac{\pi}{4}$ **b** arccos $x = 0$ **c** arctan $x = -\frac{\pi}{3}$

   d arccos $2x = \frac{\pi}{6}$ **e** $\frac{\pi}{4}$ − arctan $x = 0$ **f** 6 arcsin $x + \pi = 0$

8 Solve each equation, giving your answers to 3 significant figures.

   a arccos $x = 2$ **b** arcsin $x = -0.7$ **c** arctan $3x = 0.96$

   d 1 − arcsin $x = 0$ **e** $2 + 3$ arctan $x = 0$ **f** 3 − arccos $2x = 0$

9 $f(x) \equiv \arccos x - \frac{\pi}{3}, \ x \in \mathbb{R}, -1 \le x \le 1.$

   a State the value of $f(-\frac{1}{2})$ in terms of π.

   b Solve the equation $f(x) = 0$.

   c Define the inverse function $f^{-1}(x)$ and state its domain.