1 Express each of the following as a simpler trigonometric function.

(a) $\sin(\pi - x)$ **(b)** $\cos\left(\frac{\pi}{2} - x\right)$ **(c)** $\tan(2\pi - x)$

(d) $\cos(\pi + x)$ **(e)** $\sin(2\pi - x)$ **(f)** $\cot\left(\frac{\pi}{2} - x\right)$

2 For any angle θ, $\cos(\pi - \theta)$ is equal to:

A $-\cos\theta$ **B** $\cos\theta$ **C** $\sin\theta$ **D** $-\sin\theta$

3 Indicate whether each statement is correct or incorrect.

(a) $\cos\left(\frac{\pi}{2} - \theta\right) = \cos\theta$ **(b)** $\cos(2\pi - \theta) = \cos\theta$ **(c)** $\sin(\pi + \theta) = \sin\theta$ **(d)** $\sin(2\pi - \theta) = -\sin\theta$

4 If $\sin x = 0.2$, write the value of:

(a) $\sin(\pi - x)$ **(b)** $\sin(2\pi - x)$ **(c)** $\sin(-x)$ **(d)** $\cos\left(\frac{\pi}{2} - x\right)$ **(e)** $\sin(\pi + x)$ **(f)** $\operatorname{cosec} x$

6 If $\cos x = c$, express the following in terms of c:

(a) $\sec x$ **(b)** $\cos(-x)$ **(c)** $\cos(\pi - x)$ **(d)** $\cos(2\pi - x)$ **(e)** $\sec(-x)$ **(f)** $\cos(\pi + x)$

7 Write the exact value of:

(a) $\sin\frac{\pi}{2}$ **(b)** $\cos\frac{2\pi}{3}$ **(c)** $\tan\frac{5\pi}{6}$ **(d)** $\cos\pi$

(e) $\sec\frac{3\pi}{4}$ **(f)** $\cot\frac{5\pi}{6}$ **(g)** $\operatorname{cosec}\frac{\pi}{2}$ **(h)** $\sin\frac{2\pi}{3}$

9 Write the exact value of:

(a) $\sin\frac{3\pi}{2}$ **(b)** $\tan\frac{5\pi}{3}$ **(c)** $\operatorname{cosec}\frac{11\pi}{6}$ **(d)** $\tan\frac{7\pi}{4}$

(e) $\cot\frac{7\pi}{4}$ **(f)** $\cos\frac{11\pi}{6}$ **(g)** $\sin\frac{5\pi}{3}$ **(h)** $\operatorname{cosec}\frac{5\pi}{3}$

12 If θ is an angle in the 2nd quadrant, state whether the following are positive or negative:

(a) $\cos(\pi-\theta)$ **(b)** $\tan(\pi+\theta)$ **(c)** $\sin\left(\frac{\pi}{2}-\theta\right)$

(d) $\sin(2\pi-\theta)$ **(e)** $\cos(\pi+\theta)$ **(f)** $\tan\left(\frac{\pi}{2}-\theta\right)$

14 Using a diagram, find equivalent expressions for:

(a) $\cos\left(\frac{3\pi}{2}+x\right)$ **(b)** $\tan\left(\frac{3\pi}{2}-x\right)$ **(c)** $\sin\left(\frac{3\pi}{2}-x\right)$

13 Solve, for $0 < x < 2\pi$:

(a) $\sin x = -\frac{\sqrt{3}}{2}$ **(b)** $\tan x = -1$ **(c)** $\cos x = -1$ **(d)** $\cot x = \sqrt{3}$

(e) $\sec x = -\sqrt{2}$ **(f)** $\sin x = \cos x$

13 Solve, for $0 < x < 2\pi$:

(g) $\sin x = 0$ **(h)** $2\cos x + 1 = 0$

(i) $2\sin x = \sqrt{3}$ **(j)** $\sin x + \sqrt{3}\cos x = 0$ **(k)** $\operatorname{cosec} x = \sec x$