

Section 1: Trigonometric functions and identities**Exercise level 2**

Do not use a calculator in this exercise.

1. Write the following as fractions or using square roots. You should not need your calculator.
 - (i) $\sin 120^\circ$
 - (ii) $\cos(-120^\circ)$
 - (iii) $\tan 135^\circ$
 - (iv) $\sin 300^\circ$
 - (v) $\cos 270^\circ$

2. In the following give your answers as fractions
 - (i) θ is acute and $\sin \theta = \frac{12}{13}$. Write down the value of $\cos \theta$.
 - (ii) θ is obtuse and $\sin \theta = \frac{7}{25}$. Write down the values of $\cos \theta$ and $\tan \theta$.
 - (iii) θ is obtuse and $\tan \theta = -\frac{8}{15}$. Write down the values of $\sin \theta$ and $\cos \theta$.

3. Using the identities $\sin^2 x + \cos^2 x \equiv 1$ and/or $\tan x \equiv \frac{\sin x}{\cos x}$, simplify
 - (i) $\frac{\sqrt{1 - \cos^2 x}}{\tan x}$
 - (ii) $\frac{\sin x}{\sqrt{1 - \sin^2 x}}$
 - (iii) $\frac{\cos^2 x}{1 + \sin x}$

4. Find exactly:
 - (i) $\sin 120^\circ - \sin 150^\circ$
 - (ii) $\tan 225^\circ + \cos(-30^\circ)$
 - (iii) $\frac{\cos 45^\circ}{\sin 135^\circ}$
 - (iv) $2 \tan 60^\circ - 2 \tan(-60^\circ)$
 - (v) $\frac{\sin 50^\circ}{\sqrt{1 - \cos^2 50^\circ}}$