Section 1: Trigonometric functions and identities

Exercise level 1

1. Without using a calculator, find the exact values of the following:
   (i) $\sec 30°$ (ii) $\cot 60°$ (iii) $\operatorname{cosec} 45°$
   (iv) $\cot 135°$ (v) $\operatorname{cosec} 150°$ (vi) $\sec 240°$
   (vii) $\operatorname{cosec} \frac{4\pi}{3}$ (viii) $\sec \frac{7\pi}{4}$ (ix) $\cot \frac{5\pi}{6}$

2. Given that $\tan x = \frac{12}{5}$ and that $0 \le x \le \frac{\pi}{2}$, prove that $\sec x = \frac{13}{5}$.

3. Given that $\sin x = \frac{3}{5}$ and that $\frac{\pi}{2} \le x \le \pi$, prove that $\cot x = -\frac{4}{3}$.

4. Find all of the values of θ between 0° and 360° that satisfy
   (i) $\sec \theta = 1$
   (ii) $\cot \theta = -0.7$
   (iii) $\operatorname{cosec} \theta = 5$
   (iv) $\cot \theta = 1$

5. Without using a calculator find values for x between 0 and 2π that satisfy
   (i) $\cot x = \sqrt{3}$
   (ii) $\sec x = \sqrt{2}$
   (iii) $\operatorname{cosec} \theta = -2$