Exercise 12.1

1. **Find the values of:**

(i) $\sin 53^\circ 40'$ (ii) $\cos 36^\circ 20'$ (iii) $\tan 19^\circ 30'$

(iv) $\cot 33^\circ 50'$ (v) $\cos 42^\circ 38'$ (vi) $\tan 25^\circ 34'$

(vii) $\sin 18^\circ 31'$ (viii) $\cos 52^\circ 13'$ (ix) $\cot 89^\circ 9'$

Solution.

From trigonometric tables or calculators, we easily have

(i) $\sin 53^\circ 40' = 0.8056$ (ii) $\cos 36^\circ 20' = 0.8055$

(iii) $\tan 19^\circ 30' = 0.3541$ (iv) $\cot 33^\circ 50' = \dfrac{1}{\tan 33^\circ 50'} = 1.4919$

(v) $\cos 42^\circ 38' = 0.7357$ (vi) $\tan 25^\circ 34' = 0.4785$

(vii) $\sin 18^\circ 31' = 0.3176$ (viii) $\cos 52^\circ 13' = 0.6128$

(ix) $\cot 89^\circ 9' = \dfrac{1}{\tan 89^\circ 9'} = 0.1736$

2. **Find θ, if:**

(i) $\sin\theta = 0.5791$ (ii) $\cos\theta = 0.9316$

(iii) $\cos\theta = 0.5257$ (iv) $\tan\theta = 1.705$

(v) $\tan\theta = 21.943$ (vi) $\sin\theta = 0.5186$

Solution. From trigonometric tables or calculators, we easily have

(i) $\sin\theta = 0.5791 \Rightarrow \theta = \sin^{-1} 0.5791 \Rightarrow \theta = 35^\circ 23'$

(ii) $\cos\theta = 0.9316 \Rightarrow \theta = \cos^{-1} 0.9316 \Rightarrow \theta = 21^\circ 19'$

(iii) $\cos\theta = 0.5257 \Rightarrow \theta = \cos^{-1} 0.5257 \Rightarrow \theta = 58^\circ 17'$

(iv) $\tan\theta = 1.705 \Rightarrow \theta = \tan^{-1} 1.705 \Rightarrow \theta = 59^\circ 36'$

(v) $\tan\theta = 21.943 \Rightarrow \theta = \tan^{-1} 21.943 \Rightarrow \theta = 87^\circ 23'$

(vi) $\sin\theta = 0.5186 \Rightarrow \theta = \sin^{-1} 0.5186 \Rightarrow \theta = 31^\circ 14'$