

Surveying
Distance Measurements
Example 1

- Convert the following angles to decimal values: -

a) $30^{\circ} 20' 5''$

b) $67^{\circ} 33' 42''$

- Convert the following angles to degrees, minutes, and seconds:

c) 74.6324°

d) 17.7496°

a) $30^{\circ} 20' 5''$

$$\begin{aligned} &\rightarrow 30^{\circ} + 20 \text{ min} \left(\frac{1 \text{ deg}}{60 \text{ min}} \right) + 5 \text{ sec} \left(\frac{1 \text{ min}}{60 \text{ sec}} \right) \left(\frac{1 \text{ deg}}{60 \text{ min}} \right) \\ &= 30^{\circ} + 0.333^{\circ} + 0.0014^{\circ} \end{aligned}$$

$$= 30.3347^{\circ}$$

$$\begin{aligned} \text{b) } 67^{\circ} 33' 42'' &= 67^{\circ} + 33 \text{ min} \left(\frac{1 \text{ deg}}{60 \text{ min}} \right) + 42 \text{ sec} \left(\frac{1 \text{ min}}{60 \text{ sec}} \right) \left(\frac{1 \text{ deg}}{60 \text{ min}} \right) \\ &= 67^{\circ} + 0.55^{\circ} + 0.117^{\circ} \end{aligned}$$

$$= 67.667^{\circ}$$

$$\begin{aligned} \text{c) } 74.6324^{\circ} &= 74^{\circ} \rightarrow 0.6324 \text{ deg} \left(\frac{60 \text{ min}}{1 \text{ deg}} \right) = 37.944 \text{ min} \\ 37' &\rightarrow 0.944 \text{ min} \left(\frac{60 \text{ sec}}{1 \text{ min}} \right) = 56.64 \text{ sec} \end{aligned}$$

$$\therefore 74.6324^{\circ} = 74^{\circ} 37' 56.64''$$

$$\begin{aligned} \text{d) } 17.7496^{\circ} &= 17^{\circ} \rightarrow 0.7496 \text{ deg} \left(\frac{60 \text{ min}}{1 \text{ deg}} \right) = 44.976 \text{ min} \\ 44' &\rightarrow 0.976 \text{ min} \left(\frac{60 \text{ sec}}{1 \text{ min}} \right) = 58.56 \text{ sec} \end{aligned}$$

$$\therefore 17.7496^{\circ} = 17^{\circ} 44' 58.56''$$