



$$\theta_1 = \alpha + \beta \quad c = \sqrt{12^2 + 2.5^2} = 12.258$$

$$\tan \alpha = \frac{12}{2.5} = 4.8 \Rightarrow \alpha = 78.232^\circ$$

$$\cos \beta = \frac{c}{2 \times 15} = \frac{c}{30} \Rightarrow \beta = 65.884^\circ$$

$$\theta_2 + 2\beta = \pi = 180^\circ \Rightarrow \theta_2 = 180 - 2\beta \Rightarrow \boxed{\theta_2 = 48.232^\circ}$$

$$\theta_1 = \alpha + \beta \Rightarrow \boxed{\theta_1 = 144.116^\circ}$$

Similarly

$$\theta_3 = \gamma + \delta \quad c_2 = \sqrt{12^2 + 12.5^2} = 17.328$$

$$\tan \gamma = \frac{12}{12.5} \Rightarrow \gamma = 43.831^\circ$$

$$\cos \delta = \frac{c_2}{30} \Rightarrow \delta = 30.010^\circ$$

$$\theta_3 = \gamma + \delta \Rightarrow \boxed{\theta_3 = 73.841^\circ}$$

$$\phi + 2\delta = 180^\circ \Rightarrow \phi = 119.98^\circ$$

$$\theta_4 = 360 - \phi \Rightarrow \boxed{\theta_4 = 240.02^\circ}$$

Thus

$$\theta_1 = 144.116^\circ$$

$$\theta_2 = 48.232^\circ$$

$$\theta_3 = 73.841^\circ$$

$$\theta_4 = 240.02^\circ$$