

$$\boxed{45} \quad r_1 = r_2 \Rightarrow 3 = 2 + 2 \sin \theta \Rightarrow 1 = 2 \sin \theta \Rightarrow \sin \theta = \frac{1}{2} \Rightarrow \theta_R = \sin^{-1} \frac{1}{2} = 30^\circ \Rightarrow \theta = 30^\circ, 150^\circ$$