

$$I. \quad \bar{u}(\theta) = 0 \text{ m/s}$$

$$\boxed{\theta \leq -75^\circ}$$

$$II. \quad (-50^\circ, -9.58 \text{ m/s}), (-75^\circ, 0)$$

note

$$u(\theta) = -9.58 + \frac{(0 + 9.58)}{(-75 + 50)} \cdot (\theta + 50)$$

$$= -9.58 + \frac{9.58}{-25} \cdot (\theta + 50)$$

$$III. \quad (-20^\circ, -6.5 \text{ m/s}), (-50^\circ, -9.58 \text{ m/s})$$

$$\boxed{-20^\circ \geq \theta > -50^\circ}$$

$$u(\theta) = -6.5 + \frac{(-9.58 + 6.5)}{(-50 + 20)} \cdot (\theta + 20)$$

$$u(\theta) = -6.5 + \frac{-3.08}{-30} \cdot (\theta + 20)$$

$$IV. \quad (0^\circ, -3.26 \text{ m/s}), (-20^\circ, -6.5)$$

$$\boxed{\theta > -20^\circ}$$

$$u(\theta) = -3.26 + \frac{(-6.5 + 3.26)}{(-20 + 0)} \cdot (\theta + 0)$$

$$= -3.26 + \frac{-3.24}{-20} \cdot \theta$$

~~-20~~