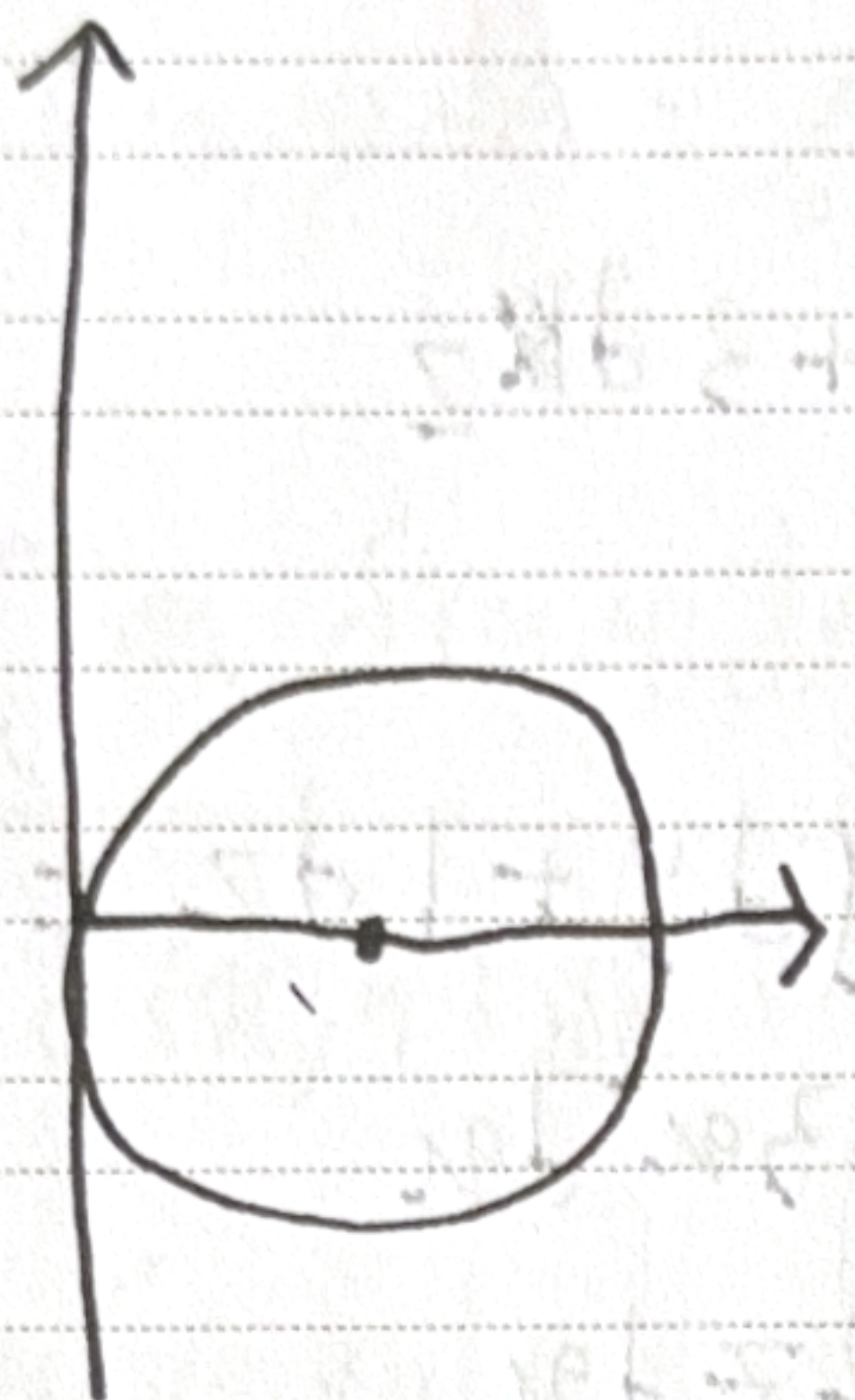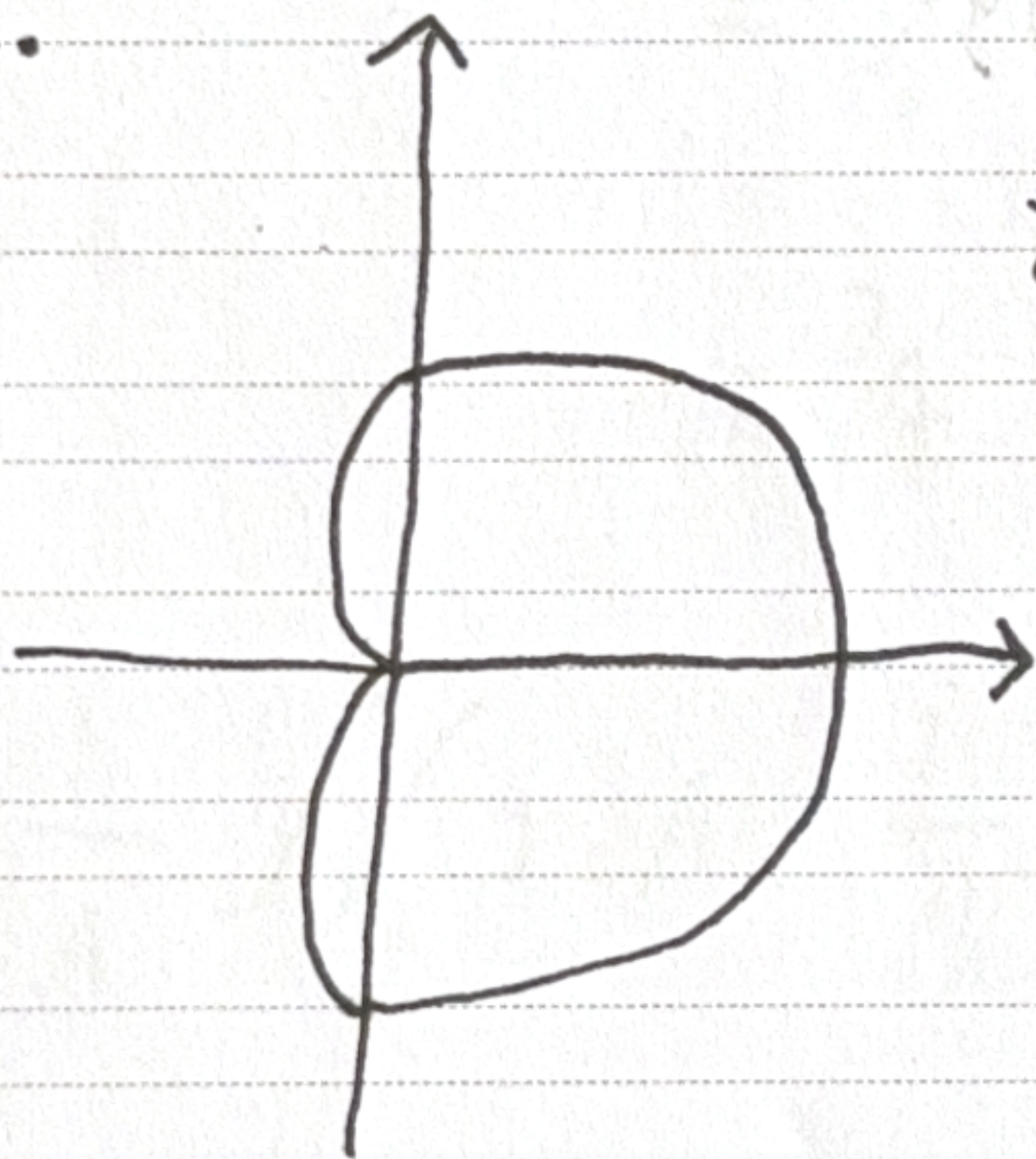**1.**

$$\int_{-\pi/2}^{\pi/2} \int_{0}^{2\cos\theta} \frac{1}{r} \, r \, dr \, d\theta$$

$$= \int_{-\pi/2}^{\pi/2} 2\cos\theta$$

$$= 2\sin\theta \Big|_{-\pi/2}^{\pi/2} = 4$$

2.

$$\int_{0}^{2\pi} \int_{0}^{1+\cos\theta} r \, dr \, d\theta$$

$$= \int_{0}^{2\pi} \frac{(1+\cos\theta)^2}{2}$$

$$= \int_{0}^{2\pi} \frac{1}{2} + \cos\theta + \frac{\cos^2\theta}{2} \, d\theta$$

$$= \pi + 0 + \frac{\pi}{2} = \frac{3\pi}{2}$$