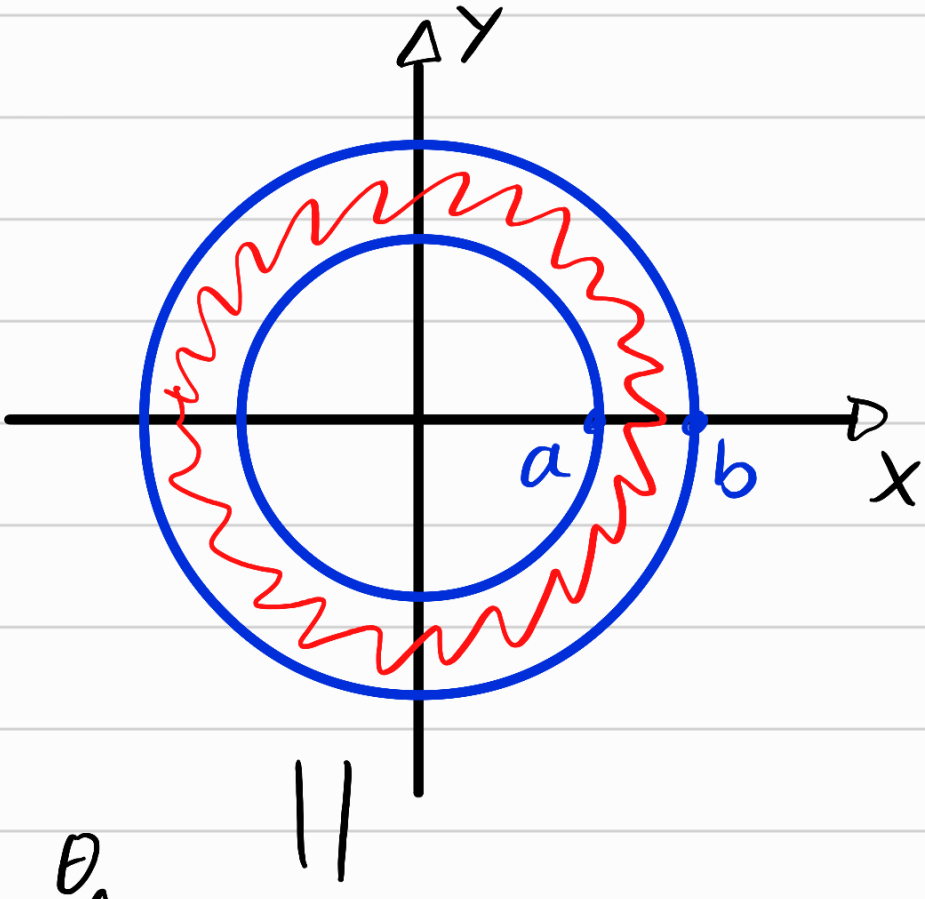
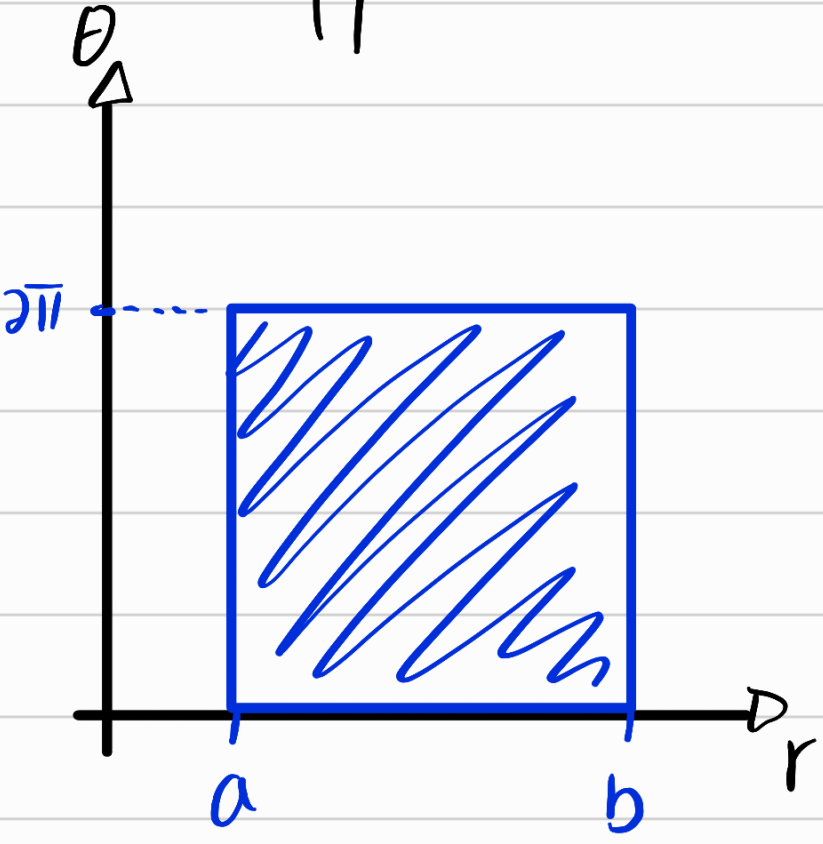
15.3 (79) $z = x^2$ $z = 0$

$y = x^2$ $y = 4$

15.4 ⑩ $\iint \frac{y^2}{x^2+y^2}\, dA$ $\quad x^2+y^2=a^2$ $\quad x^2+y^2=b^2$

$0 < a < b$





$$\begin{cases} x = r\cdot\cos(\theta) \\ y = r\cdot\operatorname{sen}(\theta) \end{cases}$$

$$\iint_R \frac{y^2}{x^2+y^2}\,dA = \int_a^b \int_0^{2\pi} \frac{r^2\cdot \operatorname{sen}^2(\theta)}{(r\cdot\cos(\theta))^2+(r\cdot\operatorname{sen}(\theta))^2}\cdot r\cdot dr\cdot d\theta$$

$$\int_a^b \int_0^{2\pi} \frac{r^2\cdot \operatorname{sen}^2(\theta)}{r^2\cdot(\cos^2(\theta)+\operatorname{sen}^2(\theta))}\cdot r\cdot dr\,d\theta$$

$$\int_a^b \int_0^{2\pi} \operatorname{sen}^2(\theta)\cdot r\cdot dr\cdot d\theta$$

$$\int_a^b r\,dr\cdot \int_0^{2\pi} \underbrace{\operatorname{sen}^2(\theta)}_{\frac{1}{2}+\frac{1}{2}\cdot\operatorname{sen}(2\theta)}\,d\theta$$