7.2 Volume Using Disk Method

WU:

1) $\frac{dy}{dx} = -x$

$\int dy = -\int x\,dx$

$y = -\frac{x^2}{2} + C$

(D) concave ↓

2) $\frac{dy}{dx} = \frac{x^3}{y^2}$ $\quad y(2) = 3$

$\int y^2\,dy = \int x^3\,dx$

$3.\ \frac{y^3}{3} = \left(\frac{x^4}{4} + C\right)^3$

$\sqrt[3]{y^3} = \sqrt[3]{\frac{3}{4}x^4 + C}$

$y = \sqrt[3]{\frac{3}{4}x^4 + C}$

$3 = \sqrt[3]{\frac{3}{4}(2)^4 + C}$

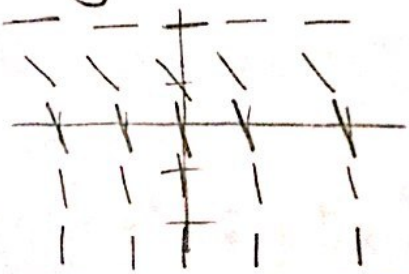
$3 = \sqrt[3]{12 + C}$

$27 = 12 + C$

$C = 15$

(E)

3) $\frac{dy}{dx} = 2y - 4$



DISK METHOD:

- used when region is adjacent to the axis of revolution
- the rectangle is perp. to the axis of revolution and perp. to the axis of integration

$$\text{Volume} = \pi \int_a^b [f(x)]^2\,dx$$

OR

$$V = \pi \int_a^b R^2$$

revolving around x-axis $R = f(x)$

revolving around dif axis $R = f(x)$-axis