

What are the formulas for finding Area Bounded Between curves.

$$\int_{x_1}^{x_2} (\text{top function}) - (\text{bottom function}) dx$$

$$\int_{x_1}^{x_2} (\text{all in terms of } x) dx$$

$$\int_{y_1}^{y_2} (\text{Right function}) - (\text{left function}) dy$$

$$\int_{y_1}^{y_2} (\text{all in terms of } y) dy$$

Find the Area of the Region bounded by $y = \sqrt[3]{x}$, $y = \frac{1}{4}x$, if $x \geq 0$.

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You can do top-bottom

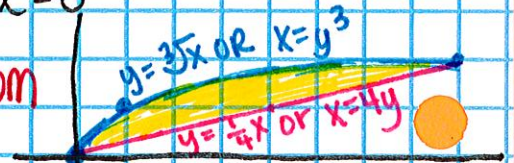
$$\int_0^8 (3\sqrt{x} - \frac{1}{4}x) dx$$

$$\int_0^8 x^{1/3} - \frac{1}{4}x dx$$

$$\frac{3}{4}x^{4/3} - \frac{1}{8}x^2 \Big|_0^8$$

$$\frac{3}{4}(3^4) - \frac{1}{8}(8)^2 - 0 + 0$$

$$\frac{3}{4}(16) - 8 = 12 - 8 = \boxed{4}$$



OR Right-left

$$\int_0^2 (4y - y^3) dy$$

$$\frac{4y^2}{2} - \frac{1}{4}y^4 \Big|_0^2 = 2y^2 - \frac{1}{4}y^4 \Big|_0^2$$

$$2(4) - \frac{1}{4}(16) = 8 - 4 = \boxed{4}$$

Find the Area of the Region bounded by $x = y + 2$ and $x = 4 - y^2$

Find the Area of the Region bounded by $x = y + 2$ and $x = 4 - y^2$

top-bottom = 2 Regions

Right-left = 1 Region

$$\int_{y_1}^{y_2} (\text{Right function}) - (\text{left function}) dy$$

$$\int_{-2}^1 (4 - y^2) - (y + 2) dy$$

$$\int_{-2}^1 4 - y^2 - y - 2 dy$$

$$\int_{-2}^1 -y^2 - y + 2 dy = 4.5$$

