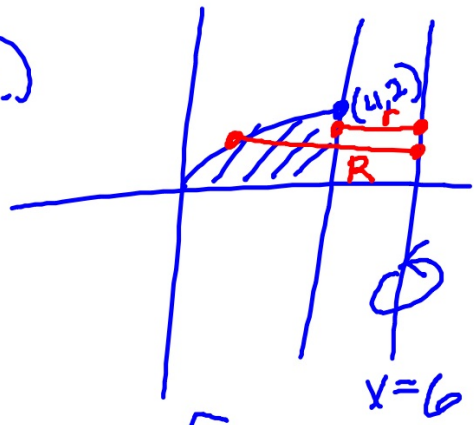
3.)



$y=\sqrt{x}$

$y^2=x$

$$\pi\int_0^2 (y^2-6)^2-(6-4)^2\,dy$$

$$\pi\int_0^2 y^4-12y^2+32\,dy$$

$$\pi\left(\frac{y^5}{5}-4y^3+32y\right)\Big|_0^2$$

1.) $\pi \int_0^8 y^{2/3}\,dy = \frac{3\pi y^{5/3}}{5}\Big]_0^8$

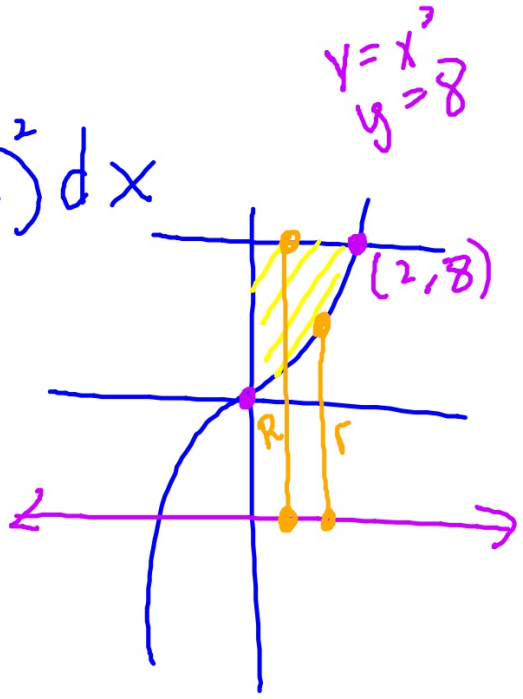
$\frac{3\pi}{5} \cdot 8^{5/3}$

$(2^3)^{5/3}$

$\frac{3\pi \cdot 32}{5}$

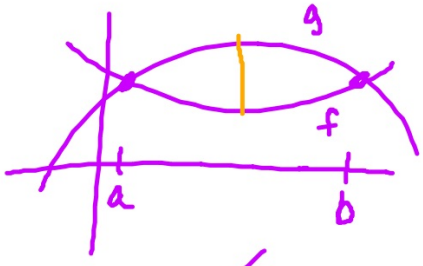
2.) washer

$$\pi \int_0^2 100 - (x^3+2)^2 \, dx$$



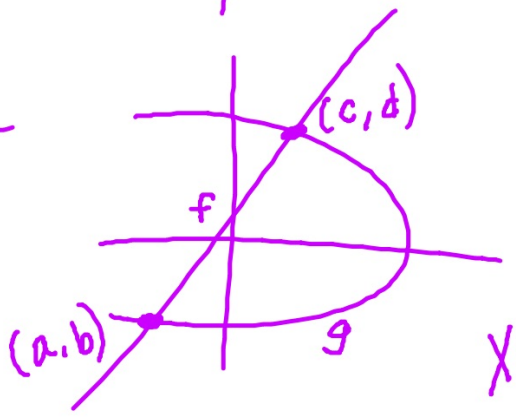
Area

Top - Bottom



$$\int_a^b (g-f)\,dx$$

Right - left



$$\int_b^d (g-f)\,dy$$

$x = y^2 + 2 \qquad y = x$

$y^2 + 2 = y$

square: s^2

rectangles: cs

equil. Δ: $\frac{\sqrt{3}}{4}s^2$

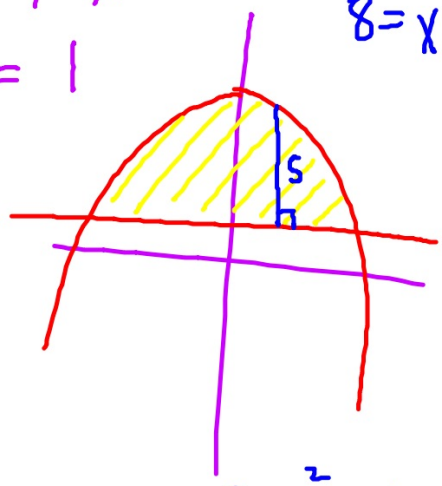
semicircle: $\frac{\pi}{8}s^2$

$y = 9 - x^2$

$y = 1$

$9 - x^2 = 1$

$8 = x^2$



$\perp$ x-axis squares

$$\int s^2 \, dx$$

$$\int_{-\sqrt{8}}^{\sqrt{8}} (8 - x^2)^2 \, dx$$

$s = 9 - x^2 - 1$

$s = 8 - x^2$

$$\int e^{4x}\,dx = \frac{1}{4}e^{4x} + C \quad \text{(u-sub)}$$

$$\int_{\pi/3}^{\pi/4} \sin x\,dx = -\cos x\Big]_{\pi/3}^{\pi/4} = -\left(\cos\frac{\pi}{4} - \cos\frac{\pi}{3}\right)$$

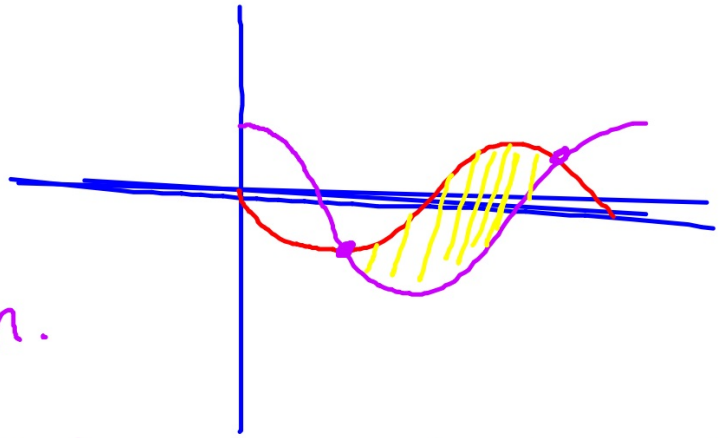
$$= -\left(\frac{\sqrt{2}}{2} - \frac{1}{2}\right) = \frac{-\sqrt{2}+1}{2}$$

$$\int \sec^2 x\,dx = \tan x + C$$

$$\int \frac{1}{5x+4}\,dx = \frac{1}{5}\ln|5x+4| + C$$

$y = -\sin x$

$y = \cos x$



find the area of the shaded region.

$$\int_{3\pi/4}^{7\pi/4} (-\sin x - \cos x)\,dx$$

$$-\frac{\sin x}{\cos x} = \frac{\cos x}{\cos x}$$

$$-\int_{3\pi/4}^{7\pi/4} (\sin x + \cos x)\,dx$$

$$-\tan x = 1$$

$$\tan x = -1$$