Be able to graph functions from the Library of Functions including sinx, cosx, tanx

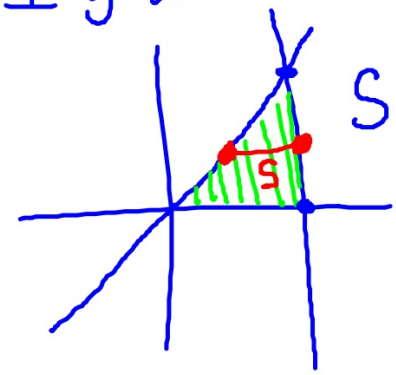
(5) $y = x$

$y = 0$

$x = 3$

squares

$\perp$ y-axis



$s = (3 - y)$

$$\int s^2\,dy = \int_0^3 (3-y)^2\,dy$$

$u = 3 - y$

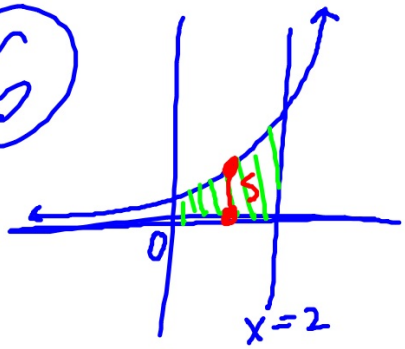
$du = -1\,dy$

$$-\int u^2\,du = -\frac{u^3}{3}$$

$$= -\frac{1}{3}(3-y)^3 \Big|_0^3$$

$$-\frac{1}{3}(0 - 27) = 9$$

6



$y = e^x \quad x = 2$

$y = 0$

$\perp$ x-axis

semicircles

$S = e^x - 0$

$$\int_0^2 \frac{\pi}{8} s^2 dx = \frac{\pi}{8} \int_0^2 (e^x)^2 dx$$

$$= \frac{\pi}{8} \int_0^2 e^{2x} dx \qquad \begin{matrix} u = 2x \\ du = 2dx \end{matrix}$$

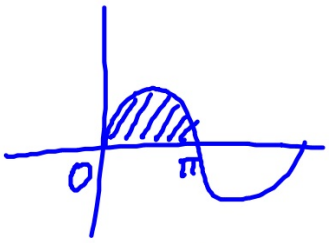
$$= \frac{\pi}{8} \cdot \frac{1}{2} \int e^u du = \frac{\pi}{16} e^u$$

$$\frac{\pi}{16} e^{2x} \Big|_0^2 = \frac{\pi}{16} (e^4 - 1)$$

(3) $y = \sin x$

$x = \pi$

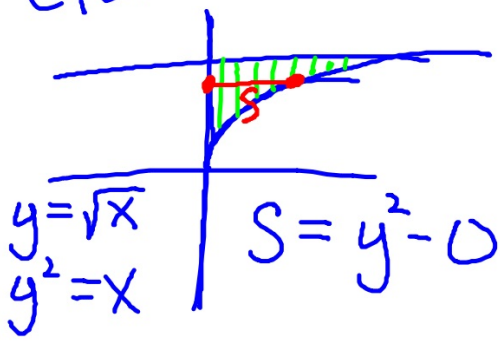
$$\int_0^{\pi} s^2\,dx = \int_0^{\pi} \sin^2 x\,dx$$



$\perp$ x-axis squares

$S = \sin x - 0$

(8) $y = \sqrt{x}$
$x = 0$
$y = 2$
$\perp$ y-axis
equil $\triangle$.



$y = \sqrt{x}$
$y^2 = x$

$S = y^2 - 0$

$$\int_0^2 \frac{\sqrt{3}}{4} S^2 \, dy = \frac{\sqrt{3}}{4} \int_0^2 (y^2)^2 \, dy$$

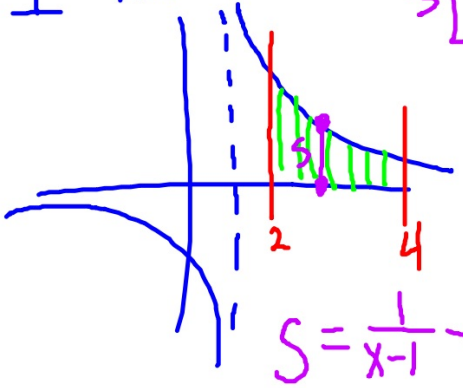
$$= \frac{\sqrt{3}}{4} \int_0^2 y^4 \, dy$$

(7) Q1 $\frac{1}{x-1}$

$x=2$ $x=4$

rect. $h=3$

$\perp$ x-axis



$S=\frac{1}{x-1}-0$

$$\int_2^4 C\cdot S\,dx=\int_2^4 3\left(\frac{1}{x-1}\right)dx$$

$$=3\ln|x-1|\Big|_2^4$$

$$=3\ln 3$$

$$=\ln 2^7$$

(4) $y = \sqrt{x-3}$

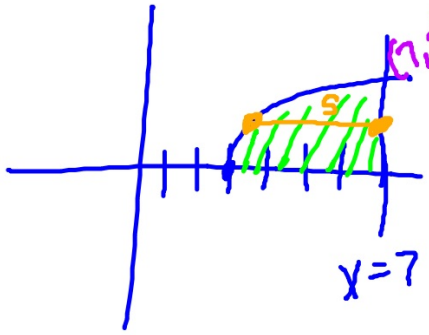
x-axis

$x = 7$

$\perp$ y-axis

equil. Δ

$\int \frac{\sqrt{3}}{4} s^2 \, dy$



$y^2 = x - 3$

$y^2 + 3 = x$

S = right - left

$S = 7 - (y^2 + 3)$

$S = (4 - y^2)$

$\frac{\sqrt{3}}{4} \int_0^2 (4-y^2)^2 \, dy$

(2) $y = x^3 \Rightarrow x = \sqrt[3]{y}$

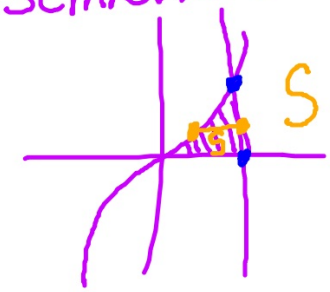
$y = 0$

$x = 2$

$\frac{\pi}{8}\int_0^8 \left(2 - \sqrt[3]{y}\right)^2 dy$

$\perp$ y-axis

semicircles



$S = \left(2 - \sqrt[3]{y}\right)$