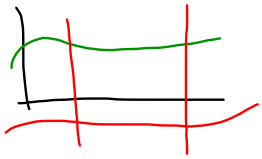
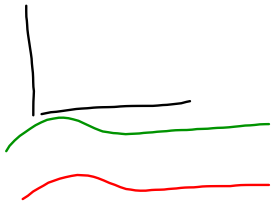
7.2 Area Between Curves

definition:



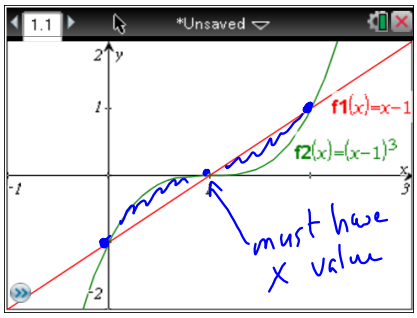
$f(x) \geq g(x)$

$f(x) \leq g(x)$



$f(x) \geq g(x)$

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



$$\int_0^1 x^2 - (-x)\, dx$$

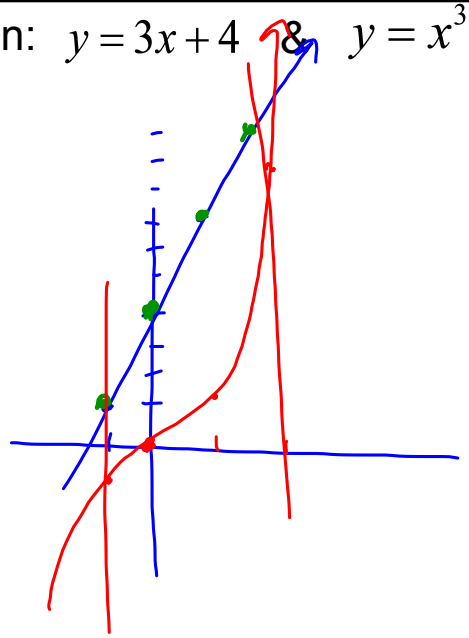
$$\int_0^1 \left(x^2 + x\right) dx$$

$$\left(\frac{x^3}{3} + \frac{x^2}{2}\right)\Bigg|_0^1$$

$$\int_0^1 (x-1)^3 - (x-1)\, dx + \int_1^2 (x-1) - (x-1)^3\, dx$$

Find the area of the region between: $y = 3x + 4$ & $y = x^3$

from x = -1 to x = 2



$$\int_{-1}^{2} (3x+4) - (x^3)\,dx$$

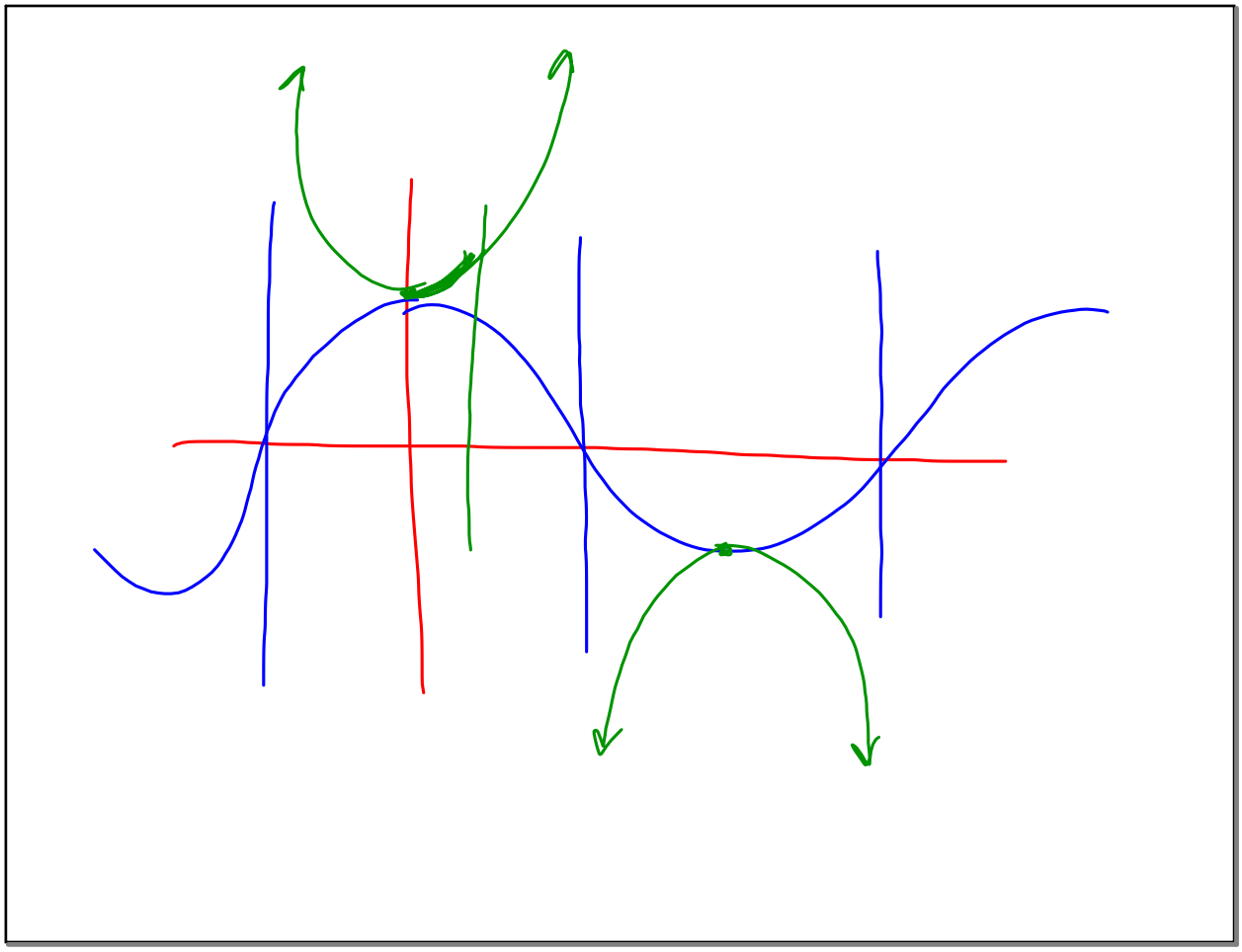
Find the area of the region between: $y = \sec^2 x$ & $y = \sin x$

between $x = 0$

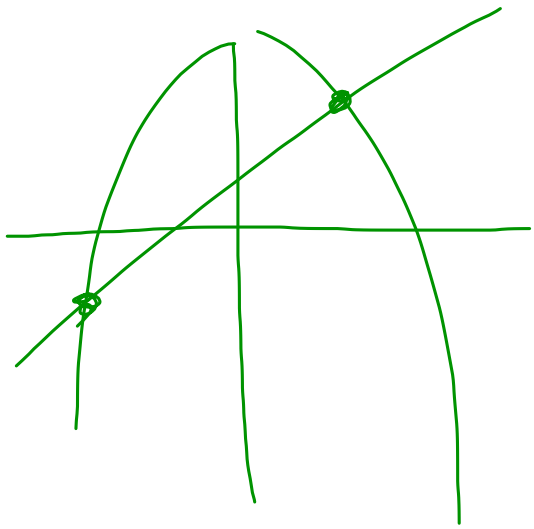
$x = \frac{\pi}{4}$

$$\int_{0}^{\pi/4} (\sec^2 x - \sin x)\,dx$$

$$(\tan x + \cos x)\Big|_{0}^{\frac{\pi}{4}}$$



Find the area of the region enclosed by the parabola $y = -3x^2 + 5$ and the line $y = 2x$



Find the area of the region bounded above by $y = \sqrt{x}$ and below by the x-axis and the line $y = x - 2$

a) by integrating with respect to x

b) by integrating with respect to y