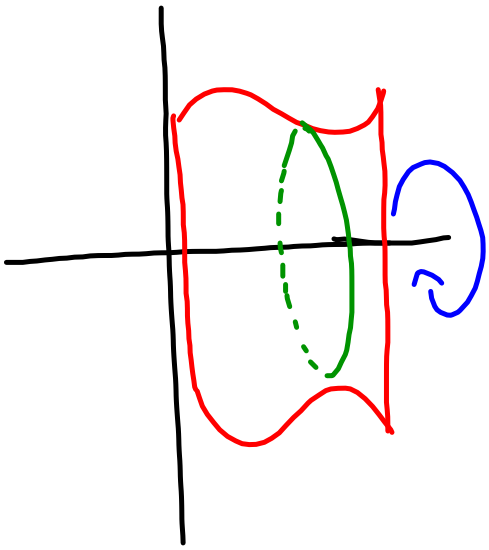
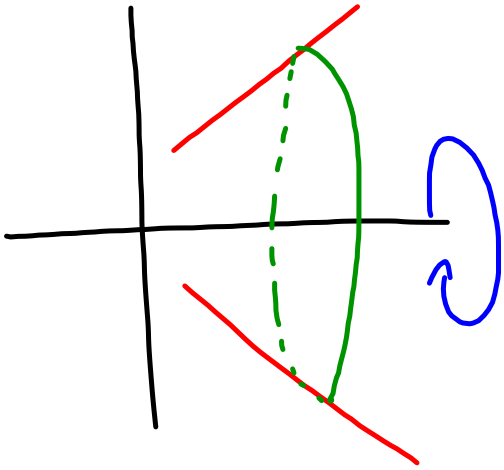
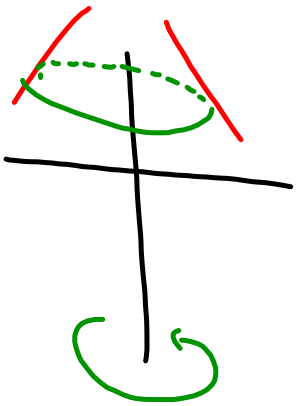
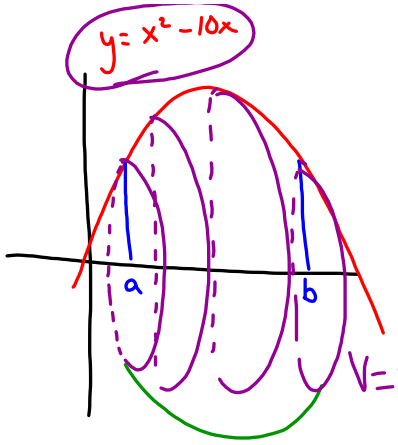
Solids of Revolution









$V = lwh$

$\pi r^2 h$

y^2

$V = \pi \int_a^b y^2 dx$ revolved around x-axis

or

$V = \pi \int_c^d x^2 dy$ y-axis

$V = \pi \int_a^b y^2 dx$

$y = x^2 - 10x$

$V = \pi \int_3^5 (x^2 - 10x)^2 dx$

$(x^2 - 10x)(x^2 - 10x)$

$x^4 - 10x^3 - 10x^3 + 100x^2$

$= \pi \int_3^5 x^4 - 20x^3 + 100x^2 dx$

$= \pi \left(\frac{x^5}{5} - \frac{20x^4}{4} + \frac{100x^3}{3} \right) \Big|_3^5$

$= \pi \left[\frac{5^5}{5} - 5(5)^4 + \frac{100(5)^3}{3} - \left(\frac{3^5}{5} - 5(3)^4 + \frac{100(3)^3}{3} \right) \right]$

$= \pi [625 - 3125 + 41666.7 - 48.6 + 405 - 900]$

$= 1123.07\pi$