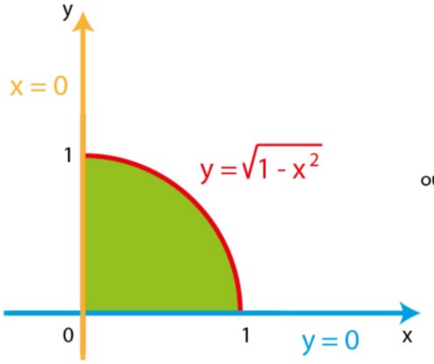
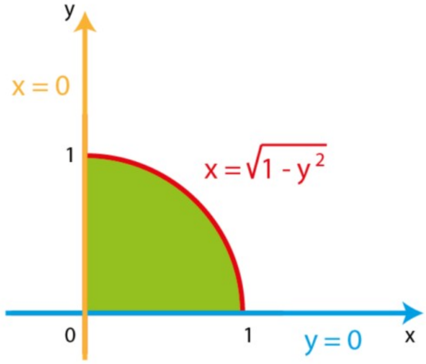
Q1. Esboço da região:




ou



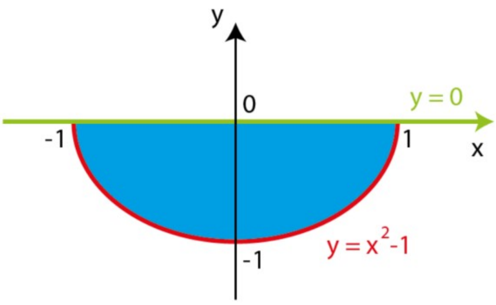

a) $V = \pi \int_0^1 \left(\sqrt{1-x^2}\right)^2 dx$

b) $V = \pi \int_0^1 \left(\sqrt{1-y^2}\right)^2 dy$

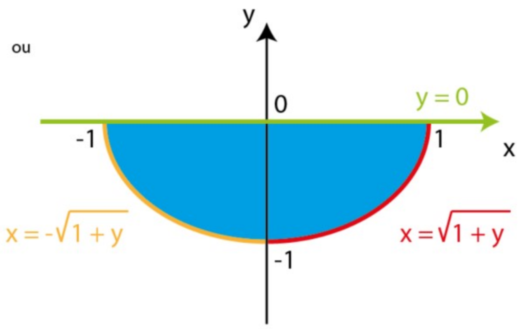
c) $V = \pi \int_0^1 (0-1)^2 dx - \pi \int_0^1 \left(\sqrt{1-x^2}-1\right)^2 dx$

d) $V = \pi \int_0^1 (0-1)^2 dy - \pi \int_0^1 \left(\sqrt{1-y^2}-1\right)^2 dy$

Q2. Esboço da região:




ou




a) $V = \pi \int_{-1}^1 (x^2-1)^2 dx$ ou $V = 2.\pi \int_0^1 (x^2-1)^2 dx$

b) (primeiro considerar uma região que esteja de um lado só do eixo de rotação)

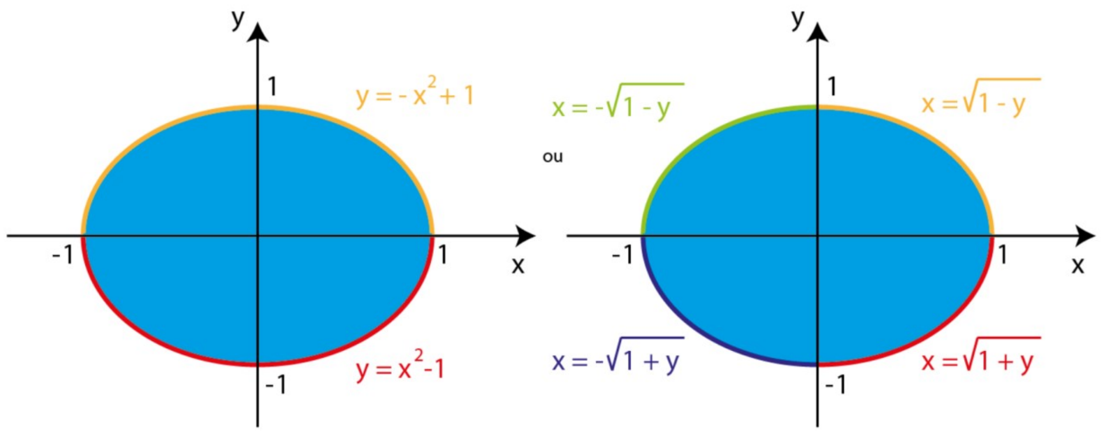
$V = \pi \int_{-1}^0 \left(\sqrt{1+y}\right)^2 dy$

c) $V = \pi \int_{-1}^1 (x^2-1-1)^2 dx - \pi \int_{-1}^1 (0-1)^2 dx$ ou

$V = 2.\left(\pi \int_0^1 (x^2-1-1)^2 dx - \pi \int_0^1 (0-1)^2 dx\right)$

d) $V = \pi \int_{-1}^0 \left(-\sqrt{1+y}-1\right)^2 dy - \pi \int_{-1}^0 \left(\sqrt{1+y}-1\right)^2 dy$

Q3. Esboço da região:




a) (primeiro considerar uma região que esteja de um lado só do eixo de rotação)

$V = \pi \int_{-1}^{1}(-x^2 + 1)^2 dx$ ou $V = 2.\pi \int_{0}^{1}(-x^2 + 1)^2 dx$

b) (primeiro considerar uma região que esteja de um lado só do eixo de rotação)

$V = \pi \int_{-1}^{0}\left(\sqrt{1+y}\right)^2 dy + \pi \int_{0}^{1}\left(\sqrt{1-y}\right)^2 dy$ ou $V = 2.\pi \int_{-1}^{0}\left(\sqrt{1+y}\right)^2 dy$

c) $V = \pi \int_{-1}^{1}(x^2 - 1 - 2)^2 dx - \pi \int_{-1}^{1}(-x^2 + 1 - 2)^2 dx$ ou

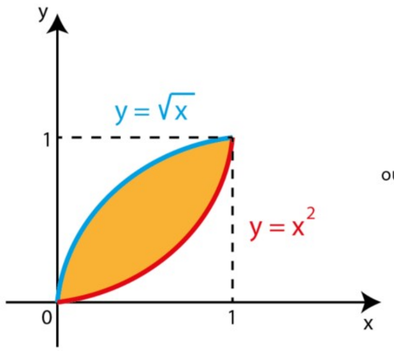
$V = 2\left(\pi \int_{0}^{1}(x^2 - 1 - 2)^2 dx - \pi \int_{0}^{1}(-x^2 + 1 - 2)^2 dx\right)$

d) $V = \pi \int_{-1}^{0}\left(-\sqrt{1+y} - 1\right)^2 dy - \pi \int_{-1}^{0}\left(\sqrt{1+y} - 1\right)^2 dy$

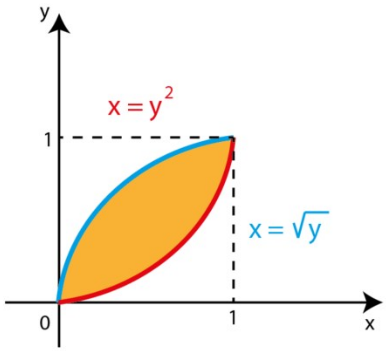
$+ \pi \int_{0}^{1}\left(-\sqrt{1-y} - 1\right)^2 dy - \pi \int_{0}^{1}\left(\sqrt{1-y} - 1\right)^2 dy$

ou $V = 2.\left(\pi \int_{0}^{1}\left(-\sqrt{1-y} - 1\right)^2 dy - \pi \int_{0}^{1}\left(\sqrt{1-y} - 1\right)^2 dy\right)$

Q4. Esboço da região:




ou



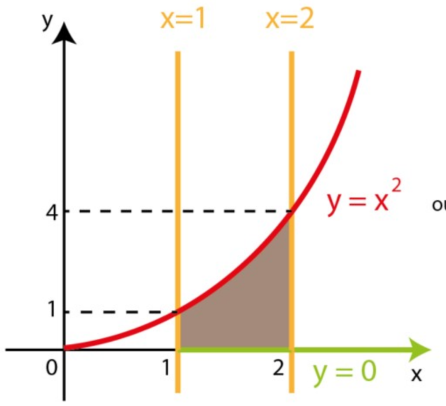

a) $V = \pi \int_0^1 \left(\sqrt{x}\right)^2 dx - \pi \int_0^1 (x^2)^2 dx$

b) $V = \pi \int_0^1 \left(\sqrt{y}\right)^2 dy - \pi \int_0^1 (y^2)^2 dy$

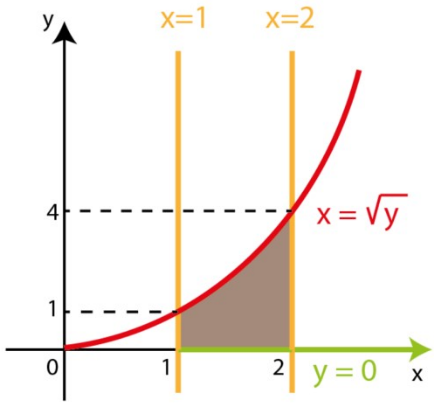
c) $V = \pi \int_0^1 (x^2 - 1)^2 dx - \pi \int_0^1 \left(\sqrt{x} - 1\right)^2 dx$

d) $V = \pi \int_0^1 (y^2 - 1)^2 dy - \pi \int_0^1 \left(\sqrt{y} - 1\right)^2 dy$

Q5. Esboço da região:




ou




a) $V = \pi \int_1^2 (x^2)^2 dx$

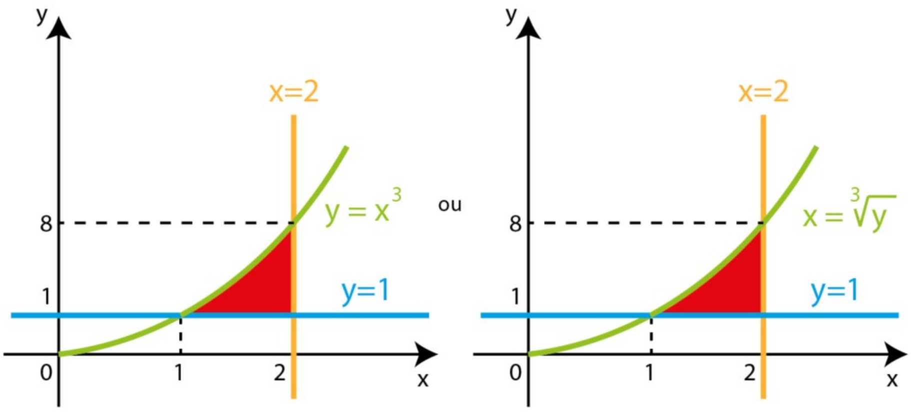
b) $V = \pi \int_0^1 (2)^2 dy - \pi \int_0^1 (1)^2 dy + \pi \int_1^4 (2)^2 dy - \pi \int_1^4 \left(\sqrt{y}\right)^2 dy$

c) (**feito em sala - caso excepcional)

$V = \pi \int_1^{\sqrt{2}} (2 - 1)^2 dx - \pi \int_{\sqrt{2}}^2 (x^2 - 1)^2 dx$

d) $V = \pi \int_0^1 (2 - 1)^2 dy + \pi \int_1^4 (2 - 1)^2 dy - \pi \int_1^4 \left(\sqrt{y} - 1\right)^2 dy$

Q6. Esboço da região:



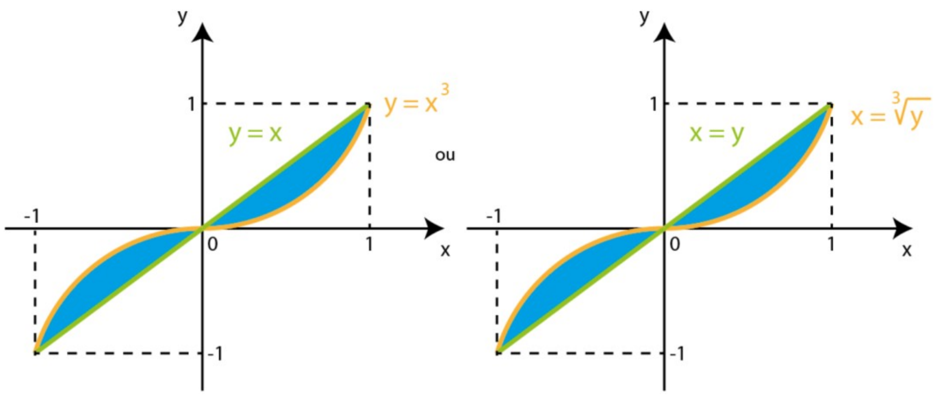

a) $V = \pi \int_1^2 (x^3)^2 dx - \pi \int_1^2 (1)^2 dx$

b) $V = \pi \int_1^8 (2)^2 dy - \pi \int_1^8 \left(\sqrt[3]{y}\right)^2 dy$

c) $V = \pi \int_1^2 (x^3 - 1)^2 dx$

d) $V = \pi \int_1^8 (2-1)^2 dy - \pi \int_1^8 \left(\sqrt[3]{y} - 1\right)^2 dy$

Q7. Esboço da região:




a) $V = \pi \int_{-1}^1 (x)^2 dx - \pi \int_{-1}^1 (x^3)^2 dx$ ou $V = 2.\left(\pi \int_0^1 (x)^2 dx - \pi \int_0^1 (x^3)^2 dx\right)$

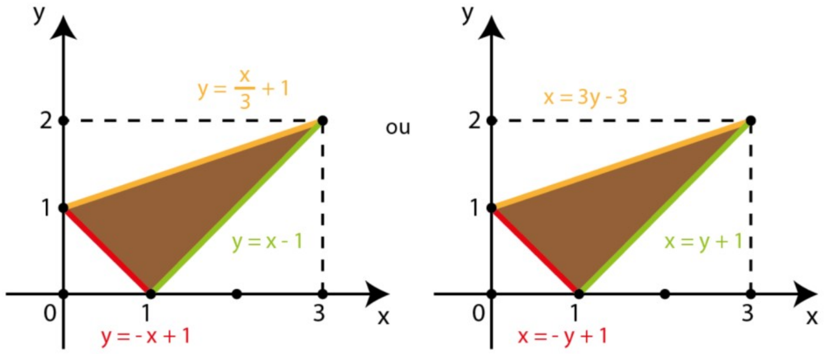
b) $V = \pi \int_{-1}^1 \left(\sqrt[3]{y}\right)^2 dy - \pi \int_{-1}^1 (y)^2 dy$ ou $V = 2.\left(\pi \int_0^1 \left(\sqrt[3]{y}\right)^2 dy - \pi \int_0^1 (y)^2 dy\right)$

c) $V = \pi \int_{-1}^0 (x-4)^2 dx - \pi \int_{-1}^0 (x^3-4)^2 dx + \pi \int_0^1 (x^3-4)^2 dx - \pi \int_0^1 (x-4)^2 dx$

d) $V = \pi \int_{-1}^0 (y-(-3))^2 dy - \pi \int_{-1}^0 \left(\sqrt[3]{y} - (-3)\right)^2 dy + \pi \int_0^1 \left(\sqrt[3]{y} - (-3)\right)^2 dy$

$-\pi \int_0^1 (y-(-3))^2 dy$

Q8. Esboço da região:




a) $V = \pi \int_0^1 (y+1)^2 dy - \pi \int_0^1 (-y+1)^2 dy + \pi \int_1^2 (y+1)^2 dy - \pi \int_1^2 (3y-3)^2 dy$

b) $V = \pi \int_0^1 \left(\frac{x}{3} + 1\right)^2 dx - \pi \int_0^1 (-x+1)^2 dx + \pi \int_1^3 \left(\frac{x}{3} + 1\right)^2 dx - \pi \int_1^3 (x-1)^2 dx$

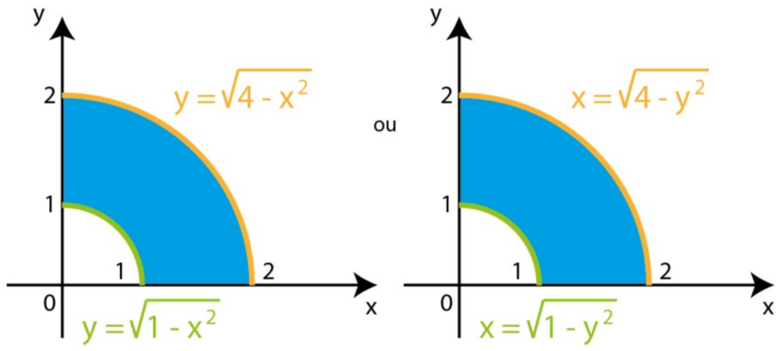
c) $V = \pi \int_0^1 (-x+1-4)^2 dx - \pi \int_0^1 \left(\frac{x}{3} + 1 - 4\right)^2 dx + \pi \int_1^3 (x-1-4)^2 dx$

$-\pi \int_1^3 \left(\frac{x}{3} + 1 - 4\right)^2 dx$

d) $V = \pi \int_0^1 (y+1-(-5))^2 dy - \pi \int_0^1 (-y+1-(-5))^2 dy$

$+\pi \int_1^2 (y+1-(-5))^2 dy - \pi \int_1^2 (3y-3-(-5))^2 dy$

Q9. Esboço da região:




a) $V = \pi \int_0^1 \left(\sqrt{4-y^2}\right)^2 dy - \pi \int_0^1 \left(\sqrt{1-y^2}\right)^2 dy + \pi \int_1^2 \left(\sqrt{4-y^2}\right)^2 dy$

b) $V = \pi \int_0^1 \left(\sqrt{4-x^2}\right)^2 dx - \pi \int_0^1 \left(\sqrt{1-x^2}\right)^2 dx + \pi \int_1^2 \left(\sqrt{4-x^2}\right)^2 dx$

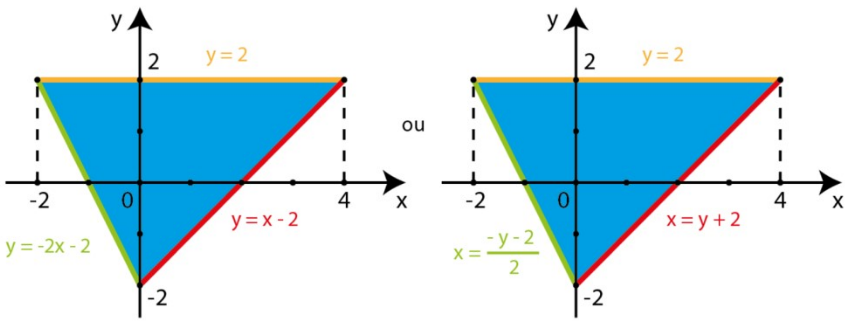
c) $V = \pi \int_0^1 \left(\sqrt{1-x^2} - 3\right)^2 dx - \pi \int_0^1 \left(\sqrt{4-x^2} - 3\right)^2 dx + \pi \int_1^2 (0-3)^2 dx$

$-\pi \int_1^2 \left(\sqrt{4-x^2} - 3\right)^2 dx$

d) $V = \pi \int_0^1 \left(\sqrt{1-y^2} - 7\right)^2 dy - \pi \int_0^1 \left(\sqrt{4-y^2} - 7\right)^2 dy + \pi \int_1^2 (0-7)^2 dy$

$-\pi \int_1^2 \left(\sqrt{4-y^2} - 7\right)^2 dy$

Q10. Esboço da região:




a) $V = \pi \int_{-2}^{0} (-2x-2-5)^2 dx - \pi \int_{-2}^{0} (2-5)^2 dx + \pi \int_0^4 (x-2-5)^2 dx$

$-\pi \int_0^4 (2-5)^2 dx$

b) $V = \pi \int_{-2}^{2} (y+2-(-3))^2 dy - \pi \int_{-2}^{2} \left(\frac{-y-2}{2} - (-3)\right)^2 dy$