Určte obsah ohraničený krivkami:

$y = 4x - x^2$, o_x — $\frac{32}{3}$

$y = x^2 + 1$, $x + y = 3$ — $\frac{7}{2}$

o_y, $x = y^2 - y^3$ — $\frac{1}{12}$

$y = x^2$, $y = x^3$ — $\frac{1}{12}$

$y = \cos x$, $y = -\pi$, $x = -\pi$, $x = \pi$ — $2\pi^2$

$y^2 = x(x-1)^2$ — $\frac{8}{15}$

$y = \cos x$, $y = \sin x$, $x = \frac{5\pi}{4}$, $x = \frac{\pi}{4}$ — $2\sqrt{2}$

$y = 2^x$, $y = 2x - x^2$, $x = 2$, o_y — $\frac{3}{\ln 2} - \frac{4}{3}$

$xy = a$, $x = a$, $x = b$, o_x, $(b > a), 0 \notin \langle a, b\rangle$ — $a \ln |\frac{b}{a}|$

$y = \ln x$, $y = \ln^2 x$ — $3 - e$

Určte objem rotačných telies ohraničených krivkami
rotácia okolo osi x

$y = \sqrt{x}$, $y = \frac{x^2}{8}$ — $\frac{24\pi}{5}$

$y = \sin x$, o_x, $x = 0$, $x = \pi$ — $\frac{\pi^2}{2}$

$y = x^2$, $x = y^2$ — $\frac{3\pi}{10}$

$y = e^x\sqrt{x}$, $x = 1$, $y = 0$ — $\frac{\pi}{4}(1 + e^2)$

$xy = a$, o_x, $x = b$, $x = c$, $(0 < b < c)$ — $\frac{a^2}{bc}(c - b)\pi$

$x^2 + y^2 = 1$, $y^2 = \frac{3}{2}x$ — $\frac{19}{48}\pi$

$x^2 - y^2 = 1$, $x > 0$ a $x = a + 1, a > 0$ — $\frac{\pi}{3}a^2(a + 3)$

$y = \sin x$, $y = \frac{2}{\pi}x$ — $\frac{\pi^2}{6}$

Určte objem rotačných telies ohraničených krivkami
rotácia okolo osi y

$x = 0$, $y^2 + x - 4 = 0$ — $\frac{512}{15}\pi$

$y = \sin x$, $x = 0$, $y = \frac{1}{2}$ — $\frac{1}{6}\pi(6 - \pi\sqrt{3})$

$\sqrt{x} + \sqrt{y} = \sqrt{a}$ — $\frac{\pi a^3}{15}$

$y = e^{-x}$, $x = 0$, $x = a$, $y = 0$, $(a > 0)$ — $2\pi(1 - \frac{a+1}{e^a})$

Určte povrchy rotačných telies, rotácia okolo osi x

$y = kx$, $x \in \langle a, b\rangle$, $0 < a < b$, $k > 0$ — $\pi k\sqrt{1 + k^2}(b^2 - a^2)$

$y = x^3$, $x \in \langle 0, 1 \rangle$ — $\boxed{\frac{\pi}{27}(10\sqrt{10} - 1)}$

$y = \sqrt{x}$, $x \in \langle 0, 2 \rangle$ — $\boxed{\frac{\pi}{6}(3\sqrt{3} - 1)}$

$y = 2\cosh\left(\frac{x}{2}\right)$, $x \in \langle 0, 2 \rangle$ — $\boxed{\pi(4 + e^2 - e^{-2})}$

$y = \frac{x^2}{2}$, $x \in \langle 0, \frac{3}{4} \rangle$ — $\boxed{\frac{\pi}{1024}(255 - 128\ln 2)}$