Predmet: Mataliza 1
Ukol: 11.
Verze: 2.
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Prezdivka: DN

zadani

plocha utvaru ohraniceneho parabolou $y^2 = x$ a primkou $y = x - 2$

reseni

nejdrive si problem obratime prohozenim x a y
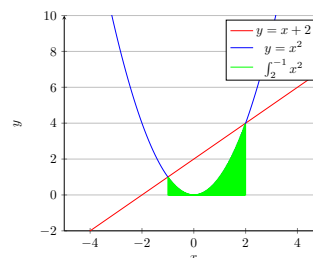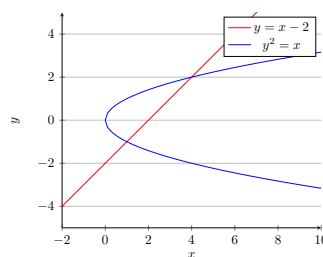funkce se protinaji v $x = -1$ a $x = 2$
$\int x + 2 \ dx = \frac{x^2}{2} + 2x + C$
$\int_{-1}^{2} x + 2 \ dx = \frac{15}{2}$
$\int x^2 \ dx = \frac{x^3}{3} + C$
$\int_{-1}^{2} x^2 \ dx = 3$

ohranicena plocha je velka $\frac{15}{2} - 3 = \underline{\underline{\frac{9}{2}}}$

zadani

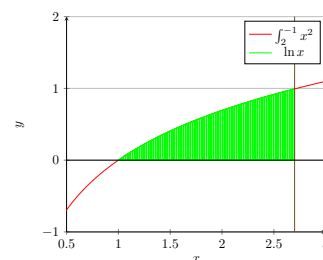plocha utvaru ohraniceneho krivkou funkce $\ln x$, osou x a
primkou $x = e$

reseni

$\int \ln x \ dx = x(\ln x - 1) + C$
$\int_{1}^{e} \ln x \ dx = e(\ln e - 1) - 1(\ln 1 - 1)$
$\int_{1}^{e} \ln x \ dx = e(1 - 1) - (0 - 1)$
$\int_{1}^{e} \ln x \ dx = 1$

zadani

objem telesa vznikleho z utvaru b) rotaci kolem osy x

reseni

$\int \pi(\ln(x))^2 dx = \pi(2x - 2x \log(x) + x \log^2(x))$
$\int_{0}^{e} \pi(\ln(x))^2 dx = \pi e$

zadani

objem komoleho rotacniho kuzele s vyskou v a polomery podstav r a R

reseni

plocha 2D telesa:
$vr + \frac{(R-r)*v}{2} = \frac{v(r+R)}{2}$
obtocime kolem osy y podle vzorecku $S = \pi r^2$
$\pi(\frac{(r+R)}{2})^2$ | mame prumerny obsah vodorovne plosky
$\pi(\frac{(r+R)}{2})^2 * v$ | prinasobime velikost telesa (ta se obtocenim kolem osy nemeni)