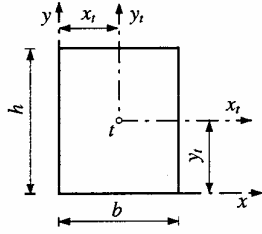
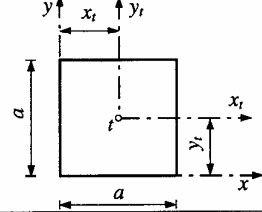
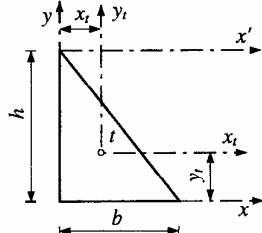
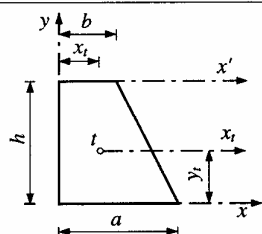
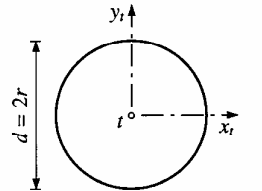
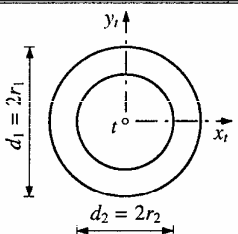
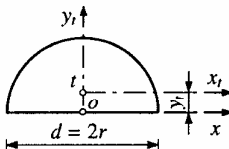
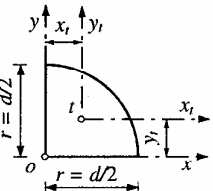
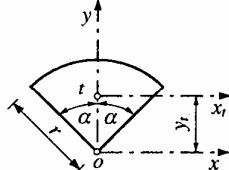
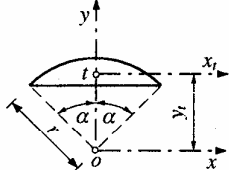


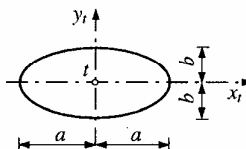
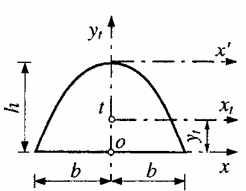
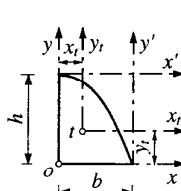
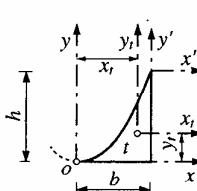
Tab. 3.1: Geometrické charakteristiky rovinných obrazců

Tvar obrazce		Obsah A , poloha těžiště t , momenty setrvačnosti I , polární I_t a deviační D
Obdélník		$A = bh; \quad x_t = \frac{b}{2}; \quad y_t = \frac{h}{2}$ $I_{x_t} = \frac{1}{12}bh^3; \quad I_{y_t} = \frac{1}{12}hb^3; \quad I_x = \frac{1}{3}bh^3; \quad I_y = \frac{1}{3}hb^3$ $D_{xy} = \frac{b^2h^2}{4}; \quad I_t = \frac{bh}{12}(b^2 + h^2)$
Čtverec		$A = a^2; \quad x_t = y_t = \frac{a}{2}$ $I_{x_t} = I_{y_t} = \frac{a^4}{12}; \quad I_x = I_y = \frac{a^4}{3}$ $D_{xy} = \frac{a^4}{4}; \quad I_t = \frac{a^4}{6}$
Pravoúhlý trojúhelník		$A = \frac{1}{2}bh; \quad x_t = \frac{b}{3}; \quad y_t = \frac{h}{3}$ $I_{x_t} = \frac{1}{36}bh^3; \quad I_{y_t} = \frac{1}{36}hb^3; \quad D_{x_t y_t} = -\frac{b^2h^2}{72}$ $I_x = \frac{1}{12}bh^3; \quad I_y = \frac{1}{12}hb^3; \quad D_{xy} = \frac{b^2h^2}{24}$ $I_{x'} = \frac{1}{4}bh^3; \quad I_t = \frac{bh}{36}(b^2 + h^2)$
Lichoběžník		$A = \frac{1}{2}(a+b)h; \quad x_t = \frac{a^2 + ab + b^2}{3(a+b)}; \quad y_t = \frac{(a+2b)h}{3(a+b)}$ $I_{x_t} = \frac{(a^2 + 4ab + b^2)h^3}{36(a+b)}; \quad I_{x'} = \frac{(3a+b)h^3}{12}$ $I_x = \frac{(a+3b)h^3}{12}; \quad D_{xy} = \frac{(a^2 + 2ab + 3b^2)h^2}{24}$
Kruh		$A = \pi r^2 = \frac{\pi d^2}{4}; \quad I_{x_t} = I_{y_t} = \frac{\pi r^4}{4} = \frac{\pi d^4}{64}$ $I_t = \frac{\pi r^4}{2} = \frac{\pi d^4}{32}$

Tab. 3.1: Geometrické charakteristiky rovinných obrazců (pokračování)

Tvar obrazce		Obsah A , poloha těžiště t , momenty setrvačnosti I , polární I_t a deviační D
Mezikruží		$A = \pi(r_1^2 - r_2^2) = \frac{\pi}{4}(d_1^2 - d_2^2)$ $I_{x_t} = I_{y_t} = \frac{\pi}{4}(r_1^4 - r_2^4) = \frac{\pi}{64}(d_1^4 - d_2^4)$ $I_t = \frac{\pi}{2}(r_1^4 - r_2^4) = \frac{\pi}{32}(d_1^4 - d_2^4)$
Půlkruh		$A = \frac{\pi r^2}{2} = \frac{\pi d^2}{8}; \quad y_t = \frac{4r}{3\pi} = \frac{2d}{3\pi}$ $I_{x_t} = \left(\frac{\pi}{8} - \frac{8}{9\pi}\right)r^4 = \left(\frac{\pi}{8} - \frac{8}{9\pi}\right)\frac{d^4}{16}$ $I_x = \frac{\pi r^4}{8} = \frac{\pi d^4}{128} = I_{y_t}; \quad I_o = \frac{\pi r^4}{4} = \frac{\pi d^4}{64}$
Čtvrtkruh		$A = \frac{\pi r^2}{4} = \frac{\pi d^2}{16}; \quad x_t = y_t = \frac{4r}{3\pi} = \frac{2d}{3\pi}$ $I_{x_t} = I_{y_t} = \left(\frac{\pi}{16} - \frac{4}{9\pi}\right)r^4 = \left(\frac{\pi}{16} - \frac{4}{9\pi}\right)\frac{d^4}{16}$ $D_{x_t y_t} = \left(\frac{1}{8} - \frac{4}{9\pi}\right)r^4 = \left(\frac{1}{8} - \frac{4}{9\pi}\right)\frac{d^4}{16}$
Kruhá výseč		$A = ar^2; \quad y_t = \frac{2}{3}r \frac{\sin \alpha}{\alpha}$ $I_{x_t} = r^4 \left(\frac{2\alpha + \sin 2\alpha}{8} - \frac{4 \sin^2 \alpha}{9\alpha} \right); \quad I_o = \frac{ar^4}{2}$ $I_x = \frac{r^4}{8}(2\alpha + \sin 2\alpha); \quad I_y = \frac{r^4}{8}(2\alpha - \sin 2\alpha)$
Kruhá úseč		$A = \left(\alpha - \frac{1}{2} \sin 2\alpha \right) r^2; \quad y_t = \frac{4r \sin^3 \alpha}{3(2\alpha - \sin 2\alpha)}$ $I_{x_t} = r^4 \left(\frac{4\alpha - \sin 4\alpha}{16} - \frac{8}{9} \frac{\sin^6 \alpha}{2\alpha - \sin 2\alpha} \right)$ $I_x = \frac{r^4}{16}(4\alpha - \sin 4\alpha); \quad I_y = \frac{r^4}{48}(12\alpha - 8 \sin 2\alpha + \sin 4\alpha)$

Tab. 3.1: Geometrické charakteristiky rovinných obrazců (pokračování)

Tvar obrazce		Obsah A , poloha těžiště t , momenty setrvačnosti I , polární I_t a deviační D
Elipsa		$A = \pi ab$ $I_{x_t} = \frac{\pi}{4} ab^3; I_{y_t} = \frac{\pi}{4} ba^3$ $I_t = \frac{\pi}{4} ab(a^2 + b^2)$
Parabolická úseč		$A = \frac{4}{3} bh; y_t = \frac{2}{5} h$ $I_{x_t} = \frac{16}{175} bh^3; I_{y_t} = \frac{4}{15} hb^3$ $I_x = \frac{32}{105} bh^3; I_{x'} = \frac{4}{7} bh^3$
Půl parabolické úseče		$A = \frac{2}{3} bh; x_t = \frac{3}{8} b; y_t = \frac{2}{5} h$ $I_{x_t} = \frac{8}{175} bh^3; I_x = \frac{16}{105} bh^3; I_{x'} = \frac{2}{7} bh^3$ $I_{y_t} = \frac{19}{480} hb^3; I_y = \frac{2}{15} hb^3; I_{y'} = \frac{3}{10} hb^3$
Parabolický trojúhelník		$A = \frac{1}{3} bh; x_t = \frac{3}{4} b; y_t = \frac{3}{10} h$ $I_{x_t} = \frac{37}{2100} bh^3; I_x = \frac{1}{21} bh^3; I_{x'} = \frac{19}{105} bh^3$ $I_{y_t} = \frac{1}{80} hb^3; I_y = \frac{1}{5} hb^3; I_{y'} = \frac{1}{30} hb^3$