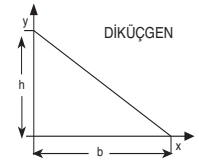
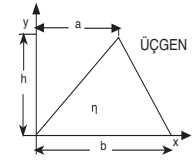
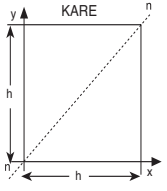
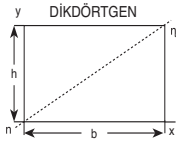
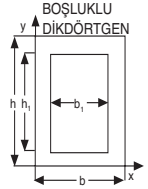
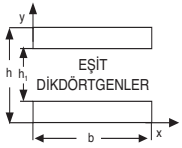
# DÜZLEMSEL GEOMETRİK ŞEKİLLERİN ÖZELLİKLERİ

| Geometrik Şekil | Alan - Geometrik Merkez | Eylemsizlik Momenti | Dayanım Momenti |
|---|---|---|---|
|  | $A = \frac{bh}{2}$<br>$X_c = \frac{b}{3}$<br>$Y_c = \frac{h}{3}$ | $I_{xc} = bh^3 / 36$<br>$I_{yc} = hb^3 / 36$<br>$I_x = bh^3 / 12$<br>$I_y = hb^3 / 12$ | $W_{xc} = \frac{bh^2}{24}$<br>$W_{yc} = \frac{hb^2}{24}$ |
|  | $A = \frac{bh}{2}$<br>$X_c = \frac{a+b}{3}$<br>$Y_c = \frac{h}{3}$ | $I_{xc} = bh^3 / 36$<br>$I_{yc} = \frac{bh}{36}(b^2 - ab + a^2)$<br>$I_x = bh^3 / 12$<br>$I_y = \frac{bh}{12}(b^2 - ab + a^2)$ | $W_{xc} = \frac{bh^2}{24}$ |
|  | $A = h^2$<br>$X_c = \frac{h}{2}$<br>$Y_c = \frac{h}{2}$ | $I_{xc} = I_{xc} = h^4 / 12$<br>$I_x = I_y = h^4 / 3$<br>$I_\pi = h^4 / 12$ | $W_{xc} = W_{yc} = \frac{h^3}{6}$ |
|  | $A = b.h$<br>$X_c = \frac{b}{2}$<br>$Y_c = \frac{h}{2}$ | $I_{xc} = bh^3 / 12$<br>$I_{yc} = hb^3 / 12$<br>$I_x = bh^3 / 3$<br>$I_y = hb^3 / 3$<br>$I_y = hb^3 / 3$<br>$I_\pi = \frac{b^3 h^3}{6(b^2 + h^3)}$ | $W_{xc} = \frac{bh^2}{6}$<br>$W_{yc} = \frac{hb^2}{6}$ |
|  | $A = bh - b_1 h_1$<br>$X_c = \frac{b}{2}$<br>$Y_3 = \frac{h}{2}$ | $I_{xc} = \frac{(bh^3 - b_1 h_1^3)}{12}$<br>$I_{yc} = \frac{(hb^3 - h_1 b_1^3)}{12}$ | $w_{xc} = \frac{1}{6}\left(\frac{bh^3 - b_1 h_1^3}{h}\right)$<br>$w_{yc} = \frac{1}{6}\left(\frac{hb^3 - h_1 b_1^3}{b}\right)$ |
|  | $A = b(h-h_1)$<br>$X_c = \frac{b}{2}$<br>$Y_c = \frac{h}{2}$ | $I_{xc} = \frac{b(h^3 - h_1^3)}{12}$<br>$I_{yc} = \frac{b^3(h - h_1)}{12}$ | $W_{xc} = \frac{b(h^3 - h_1^3)}{6h}$<br>$W_{yc} = \frac{b^2(h - h_1)}{6}$ |

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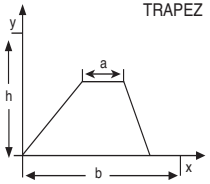
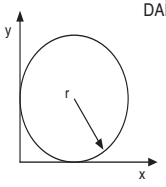
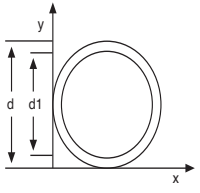
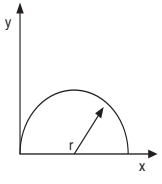
| TRAPEZ   | $A = \frac{h}{2}(a+b)$ <br> $y_c = \frac{h}{3}\frac{(2a+b)}{a+b}$ | $I_{xc} = \frac{h^3(a^2+4ab+b^2)}{36(a+b)}$ <br> $I_x = \frac{h^3(3a+b)}{12}$ | $W_{xc} = \frac{I_{xc}}{h-y_c}$ |
| DAİRE   | $A = \pi r^2$ <br> $X_c = r$ <br> $Y_c = r$ | $I_{xc} = I_{xc} = \frac{\pi r^4}{4}$ <br> $I_x = I_y = \frac{5\pi a^4}{4}$ | $W_{xc} = W_{yc} = \frac{\pi r^3}{4}$ |
| BOŞLUKLU DAİRE   | $A = \frac{\pi(d^2-d^2_1)}{4}$ <br> $X_c = \frac{d}{2}$ <br> $Y_c = \frac{d}{2}$ | $I_{xc} = I_{yc} = \frac{\pi(d^4-d^4_1)}{64}$ | $W_{xc} = W_{yc} = \frac{\pi(d^4-d^4_1)}{32d}$ |
| YARIM DAİRE   | $A = \frac{\pi r^2}{2}$ <br> $X_c = r$ <br> $Y_c = \frac{4r}{3\pi}$ | $I_{xc} = \frac{r^4(9\pi^2-64)}{72\pi}$ <br> $I_{yc} = \frac{\pi r^4}{8}$ <br> $I_x = \frac{\pi r^4}{8}$ <br> $I_y = \frac{5\pi r^4}{8}$ | $W_{xc} = \frac{I_{xc}}{(r-y_c)}$ <br> $W_{yc} = \frac{\pi r^3}{8}$ |

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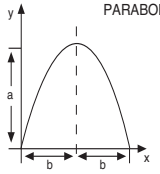
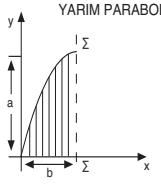
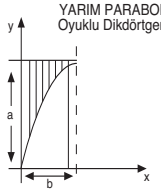
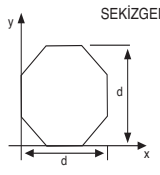
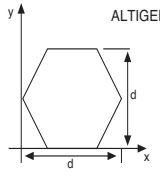
|  | $A = \frac{4}{3} ab$<br>$X_c = b$<br>$y_c = \frac{2}{5} a$ | $I_{xc} = \frac{16}{175} a^3 b$<br>$I_{xc} = \frac{4}{15} ab^3$<br>$I_x = \frac{32}{105} a^3 b$ | $W_{xc} = \frac{16}{105} a^2 b$<br>$W_{yc} = \frac{4}{15} ab^2$ |
|  | $A = \frac{2}{3} ab$<br>$X_c = \frac{5}{8} b$<br>$y_c = \frac{2}{5} a$ | $I_{xc} = \frac{8}{175} a^3 b$<br>$I_{yc} = \frac{19}{480} ab^3$<br>$I_x = \frac{16}{105} a^3 b$<br>$= \frac{2}{15} ab^3$ | $W_{xc} = \frac{8}{105} a^2 b$<br>$W_{yc} = \frac{19}{300} ab^2$ |
|  | $A = \frac{1}{3} ab$<br>$X_c = \frac{1}{4} b$<br>$y_c = \frac{7}{10} a$ | $I_{xc} = \frac{37}{2100} a^3 b$<br>$I_{yc} = \frac{1}{80} ab^3$ | $W_{xc} = \frac{37}{1470} a^2 b$<br>$W_{yc} = \frac{1}{60} ab^2$ |
|  | $A = 0.8284\ d^2$<br>$X_c = y_c = \frac{d}{2}$ | $I_{xc} = I_{yc} = 0.055\ d^4$ | $W_{xc} = W_{yc} = 0.110\ d^3$ |
|  | $A = 0.866\ d^2$<br>$X_c = y_c = \frac{d}{2}$ | $I_{xc} = I_{yc} = 0.06\ d^4$ | $W_{xc} = W_{yc} = 0.120\ d^3$ |

A = geometrik şeklin alanı
$X_c$, $y_c$ = alan geometrik merkezinin x ve y koordinatları
$I_{xc}$, $I_{yc}$ = alanın geometrik merkezden geçen ve x, y koordinat eksenlerine paralel olan eksenler etrafındaki eylemsizlik momentleri
$I_x$, $I_y$ = alanın x, y koordinat eksenleri etrafındaki eylemsizlik momentleri
$W_{xc}$, $W_{yc}$ = alanın geometrik merkezden geçen ve x, y koordinat eksenlerine paralel olan eksenler etrafındaki dayanım momentleri