Line

General equation

Ax+By+C=0

Point slope equation

y-y1=m(x-x1)

Slope of a straight line (m)

m=-A/B
m=(y2-y1)/(x2-x1)
m=tg(α)

Positions relative to two lines

Equations

Ax+By+C=0
A'x+B'y+C'=0

Secant lines

A/A'≠B/B'

Parallel lines

A/A'=B/B'≠ C/C'

Coincident lines

A/A'=B/B'= C/C'

Parallel lines

Slope

m1=m2
-A/B=-A'/B'

Perpendicular lines

Slope

m1.m2=-1
-A/B=B'/A'

Points

Coordinates

P(x1,y1)
Q(x2,y2)
M(x3,y3)

Distance between two points (P and Q)

d=√ [(x2-x1)^2+(y2-y1)^2]

Midpoint (M)

x3=(x1+x2)/2
y3=(y1+y2)/2

Distance from a point (P) to a line

d=|(A.x1+B.y1+C)/√(a^2+b^2)|

Circumference

Ordinary equation

(x-a)^2+(y-b)^2=r^2

Elements

Center: C(a,b)
Point: P(x,y)
Radius: r

General equation

x^2+y^2+Ax+By+C=0
If:
(A/2)^2+(B/2)^2-C>0
x and *y* don't multiply
x^2 and *y^2* have *1* as coefficient

Elements

A=-2a
B=-2b
C=a^2+b^2-r

Ellipse

Equation

[(x-x0)^2]/(a^2)+[(y-y0)^2]/(b^2)=1
Center: *C(x0,y0)*
Horizontal radius: *a*
Vertical radius: *b*

Parabola

General equation

Ax^2+Bxy+Cy^2+Dx+Ey+F=0
If:
A≠0 v B≠0
B^2-4AC=0

Vertical Parabola Ordinary Equation

(x-x0)^2=2p(y-y0)
Vertex: V(x0,y0)
Parameter: p

Horizontal Parabola Ordinary Equation

(y-y0)^2=2p(x-x0)
Vertex: V(x0,y0)
Parameter: p

Hyperbola

General equation

Ax^2+Bxy+Cy^2+Dx+Ey+F=0
If:
A≠0 ^ B≠0
A.B<0

Ordinary Equation (horizontal focal axis)

[(x-x0)^2]/(a^2)-[(y-y0)^2]/(b^2)=1

Ordinary Equation (vertical focal axis)

[(y-y0)^2]/(b^2)-[(x-x0)^2]/(a^2)=1

Equilateral Hyperbola Equation

a=b

Asymptotes

y=x
y=-x

Elements

Center: *O(x0,y0)*
Length of the semimajor axis of the hyperbola: *a*
Length of the semi-minor axis of the hyperbola: *b*

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