Arithmetic

$a_n = a_1 + d(n-1)$

$s_n = \frac{n(a_1+a_n)}{2}$

Geometric

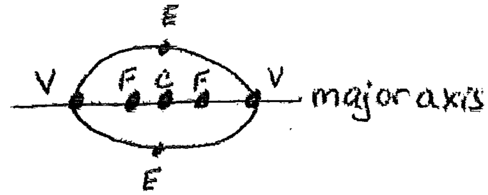
$a_n = a_1(r)^{n-1}$

$s_n = \frac{a_1(1-r^n)}{(1-r)}$

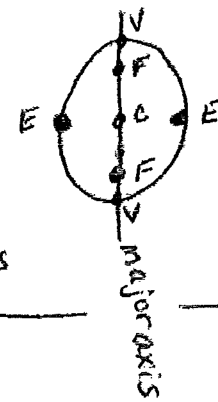
$S = \frac{a_1}{(1-r)} \;\; if \; |r| < 1$

## Ellipse  $(h,k)$ = center

$$\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1 \qquad a>b$$




$$\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1 \qquad b>a$$




E = end point
V = vertex
C = center
F = focus

$a$ = Left/Right from center
$b$ = Up/Down from center
$c = \sqrt{|a^2-b^2|}$ from center on major axis

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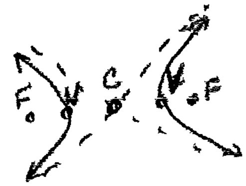
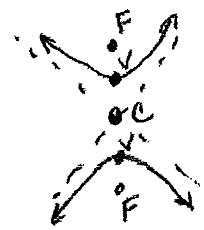
## Hyperbola  $(h,k)$ = center

$$\frac{(x-h)^2}{a^2}-\frac{(y-k)^2}{b^2}=1$$




$$\frac{(y-k)^2}{b^2}-\frac{(x-h)^2}{a^2}=1$$




V = vertex
C = center
F = focus

$a$ = Left/Right from center
$b$ = Up/Down from center
$c = \sqrt{a^2+b^2}$ from center to focus
$y-k = \pm \frac{b}{a}(x-h)$  asymptotes

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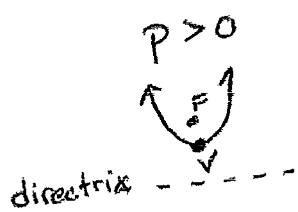
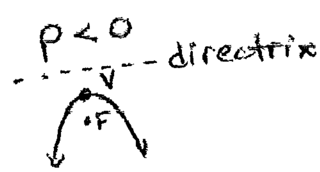
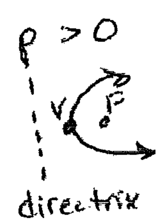
## Parabola  $(h,k)$ = vertex

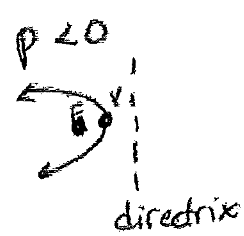
$$(x-h)^2 = 4p(y-k)$$




$$(y-k)^2 = 4p(x-h)$$




$p$ = from vertex to focus/directrix