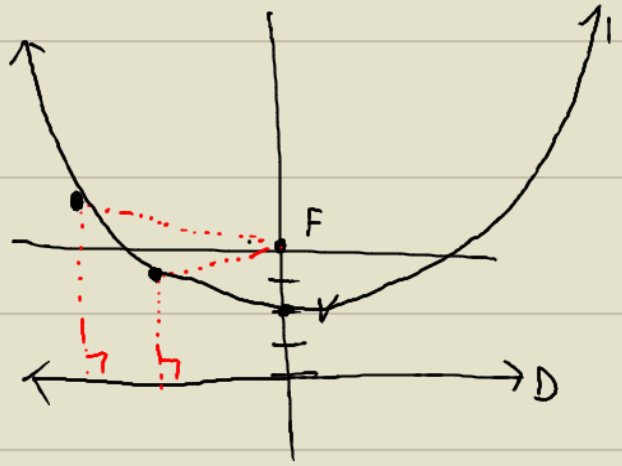
4. $r = \frac{4}{1 - \sin\theta}$ $e = 1$ PARABOLA



$r = \frac{e\ p}{1 - 1\sin\theta} = \frac{1(4)}{1 - 1\sin\theta}$

DIR: $y = -p$

$y = -4$

5. $r = \frac{2}{1 - 2\cos\theta}$

$= \frac{e\ p}{1 - 2\cos\theta} = \frac{(2)(1)}{1 - 2\cos\theta}$ $e = 2$ $p = 1$

HYPERBOLA

VERTICES

$\theta = 0$

$r = \frac{2}{1 - 2\cos 0}$

$r = \frac{2}{1 - 2(1)}$

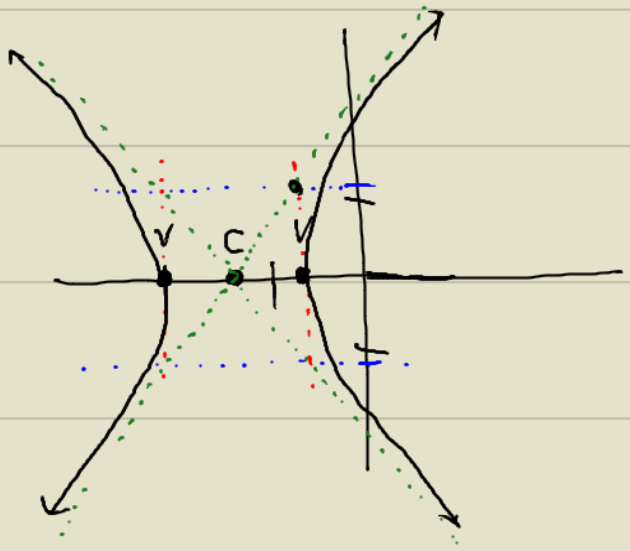
$r = -2$

$\theta = \pi$

$r = \frac{2}{1 - 2\cos\pi}$

$r = \frac{2}{1 - 2(-1)}$

$r = \frac{2}{3}$



CENTER $= \frac{-2\ -\frac{2}{3}}{2} = \frac{-6-2}{6} = -\frac{8}{6} = -\frac{4}{3}$

$c = \frac{4}{3}$

$a = \frac{c}{e} = \frac{4/3}{2} = \frac{4}{6} = \frac{2}{3}$

$b = \sqrt{c^2 - a^2}$

$b = \sqrt{\left(\frac{4}{3}\right)^2 - \left(\frac{2}{3}\right)^2} = \sqrt{\frac{16}{9} - \frac{4}{9}} = \sqrt{\frac{12}{9}} = 1.15$