Ophthalmic Optics Formulas

$s = \frac{y^2}{2r}$ Approximate Sagittal Depth

$P = \frac{2(n-1)s}{y^2}$ Lens Clock

$\frac{n_T - 1}{P_T} = \frac{n_C - 1}{P_C}$ Lens Clock Correction

$A_1O = t\frac{P_2}{P_1 + P_2}$ Optical Center Location

$$Sph\ Equiv = Sphere + \frac{Cylinder}{2}$$

$P_\theta = P_{sph} + P_{cyl}\sin^2\alpha$ Power in Oblique Meridian

$P_A = P_1 + P_2$ Approximate Power

$P'_V = \frac{P_1}{1 - \frac{d}{n}P_1} + P_2$ Back Vertex Power

$P_{CL} = \frac{P_{SPEC}}{1 - dP_{SPEC}}$ Spec Power to CL Power

$x_S = f_S^2 P'_V$ Lensometer

$ET = CT - S_1 + S_2$ Lens Thickness

$$\text{Amp of Accommodation} = \frac{1}{\text{far point}} - \frac{1}{\text{near point}}$$

$$segment\ inset = \frac{(distance\ PD - Near\ PD)}{2}$$

Minimum Blank Size = ED + 2 (dec)

Decentration (per eye) = (Frame PD - Patient PD) / 2

$\Delta = dP$ Prentice's Rule

$d_\alpha = d \cos \alpha$ Prism Power in Oblique Meridian

Image Jump = (distance of seg OC from seg top (cm))(add power) Differential Prism

$I_R = \frac{(n'-n)^2}{(n'+n)^2}(I)$ Reflection at lens surface

$n_{coating} = \sqrt{n_{lens}}$ Index of AR Coating

$Ideal\ Optical\ Thickness = \lambda / 4$ Optical Thickness of AR Coating

$Ideal\ Physical\ Thickness = \lambda /(4n_c)$ Physical Thickness of AR Coating

$T_T = T_1 x T_2 x T_3 \ldots$ Total (ultimate) Transmission

$Opacity = \frac{1}{T}$ Opacity

Density = -logT Optical Density

$SM = \left[\frac{1}{1 - \frac{t}{n} P_1} \right] \left[\frac{1}{1 - hP_V'} \right]$ Spectacle Magnification