

Final Exam Review, 2007/2008

Formulas

1. Vergences

$$L = \frac{1}{l} \quad (L \text{ is vergence, } l \text{ is object distance from lens})$$

$$L + F = L' \quad (F \text{ is lens power, } L' \text{ is total power producing image})$$

$$L' = \frac{1}{l'} \quad (l' \text{ is image distance})$$

$$\frac{l}{O} = \frac{l'}{I} \quad (l \text{ is image size, } O \text{ is object size})$$

2. Effective Power

$$F_{ef} = \frac{F}{1+dF} \quad (F \text{ is lens power, } d \text{ is change in vertex distance (tested-new)})$$

3. Compensated Power

$$F_{cp} = \frac{F}{1-dF} \quad (F \text{ is lens power, } d \text{ is change in vertex distance (tested-new)})$$

4. Combining 2 Prescriptions with oblique axis

First, put both Rx's in + cylinder form. Label the one with the lowest axis "A"

$$R_{cyl} = \sqrt{A^2 + B^2 + 2AB \cos 2\alpha} \quad (A \text{ is cyl of 1st Rx, } B \text{ is cyl of 2nd Rx, } \alpha \text{ is difference between axis})$$

$$\text{New Sph} = SA + SB + \frac{A + B - R_{cyl}}{2} \quad (SA \text{ is 1st sphere, } SB \text{ is 2nd sphere})$$

$$\text{New Axis: } \sin 2\gamma = \frac{B \sin 2\alpha}{R_{cyl}} \quad (\gamma \text{ is added to the smallest axis to get new axis})$$

5. Changing Tilt

$$F_{(ns)} = F_{(os)} \left(1 + \frac{\sin^2 \theta}{3} \right) \quad (\theta \text{ is the degree of tilt, } F_{(ns)} \text{ is new sphere, } F_{(os)} \text{ is old sphere})$$

$$F_{(ic)} = F_{(os)} (\tan^2 \theta) \quad (F_{(ic)} \text{ is induced cyl, axis is always } 180)$$

6. Image Jump

Find distance from NOC to top of seg. $RS = \frac{1}{2}$ seg width, $FT = \text{Depth} - \frac{1}{2}$ Width.
Jump = Distance to NOC X Seg Power, ALWAYS Base Down.

7. Front Vertex Power

$$F_v = \frac{F_2}{1 - t/n F_2} + F_1 \quad (\text{F}_2 \text{ is back surface power, F}_1 \text{ is front surface power, T is thickness, n is index})$$

8. Back Vertex Power

$$F_v = \frac{F_1}{1 - t/n F_1} + F_2 \quad (\text{F}_2 \text{ is back surface power, F}_1 \text{ is front surface power, T is thickness, n is index})$$

9. Lens Thickness

$$T = \frac{|Y^2 F|}{|(n-1)2000|} + CT \text{ or } ET \quad (\text{Y is } \frac{1}{2} \text{ mlbs or } 1/2(\text{frame PD} - \text{PD} + \text{ED}))$$

10. Compounding Prism

$$R^2 = V^2 + H^2$$

$$\tan \theta = V/H \quad (\text{remember adding or subtracting from quadrants})$$

11. Resolving Prism

$$V = P \sin a$$

$$H = P \cos a$$

(remember determining what quadrant)

12. Approximate power formula

$$F_t = F_{(\text{sph})} + F_{(\text{cyl})} (\sin \alpha)^2 \quad (\text{where } \alpha \text{ is the difference between the Rx axis and the axis you want the power in})$$

13. Prentices Formula!!!!!!!!!!!!

$$\Delta = cF$$

used in almost everything!!!!