Lensometry:

Also called the lensmeter, focimeter, vertometer, the lensometer can measure the power, axis, prism, and optical center of a lens through a process by which the prescription of an existing pair of glasses is determined.

The four properties that can be measured:

1) Sphere and cylinder power, expressed in dipoters (D)
2) Axis of the lens that has a cylindrical component
3) Presence of prism and its direction, expressed in prism diopters (Δ)
4) Optical center of a lens.

Identify the parts of a lensometer.

Process for lensometry (Plus cylinder):

Step 1: CHECK LENSMETER'S POWER SWITCH

- Turn on.

Step 2: FOCUS THE EYEPIECE.

- Rotate counterclockwise until reticle is blurred, then rotate clockwise, just until clear.

Step 3: POSITION THE SPECTACLES

- Position glasses on the spectacle table with temples facing away from the operator allowing for measurement of the back surface of the lens.
- Be sure that the glasses are resting evenly on the spectacle table to prevent rotation of the lens and an incorrect reading. This is especially important for axis and prism determination.
- Use the spectacle stage/lever to center mires in the reticle.
- Note 2 sets of lines: a set of triple lines widely spaced and a single set of lines (actually a set of triple lines closely spaced.)

Ste 4: ALIGN THE AXIS

- If the lines appear broken, rotate the axis wheel until they appear straight.

Step 5: MEASURE THE SPHERE POWER

- Turn power drum towards you (Plus Cylinder, always rotates toward yourself) until the first mire comes into focus. (*Note, in minus cylinder, follow same steps, but rotate the power drum away from you.*) If it is the triple lines that come into focus first, rotate the axis wheel by 90˚, then try again. *Note, if the single line appears broken, rotate the axis wheel until the line appears straight. Note the axis measurement on the axis wheel. This is the cylinder axis reading in degrees (˚).* As the power drum is dialed towards you, the single line mire should come into focus first. (Note the measurement on the power drum. This "1st reading" is the spherical power in diopters)
- If the single line and the triple line come into focus simultaneously, the lens is spherical.

- If the single line is in focus, but the triple lines are blurred, then the lens is a spherocylindrical lens. Additional steps must be conducted to determine the cylinder power.

Step 6: MEASURE THE CYLINDER POWER (if present)

- Turn the power drum towards you until the triple lines come into focus. (Make note of the measurement on the power drum. This is your "2nd reading," which you will need to determine the cylinder power.)
- The cylinder power is the difference between the 1st reading (single line in focus) and the 2nd reading (triple lines in focus).

Example:	First reading (single line in focus)=	+ 1.00D	Difference= +2.50D
	Second reading (triple line in focus) =	+ 3.50D	

So far, our prescription reading is **+1.00 +2.50** x 120 *(axis determined by axis wheel).*

Step 7: CENTER BIFOCAL SEGMENT IN THE LENSMETER

- Reposition THE lens and center the mires of the bifocal in the crosshairs of the reticle.
- Neutralize the power of the bifocal lens.

Step 8: REFOCUS THE SINGLE LINE AND NOTE THE READING FROM THE POWER DRUM

- Rotate the power drum towards you until single line comes into focus. (Note the measurement on the power drum. This "3rd reading" which you will need to determine the bifocal add power.)
- The bifocal add power is the difference between the 1st reading (single line in focus in the upper distance portion of the lens) and the 3rd reading (single line in focus in the bifocal area of the lens).

Example:	First reading (single line in focus)=	+ 1.00D	Difference= +2.75D
	Second reading (triple line in focus) =	+ 3.75D	

Now our prescription reading is +1.00 +2.50 x 120, Add + 2.75D

Steps for Transposition:

1) Add cylinder power to the sphere power. This gives you the NEW sphere power.
2) Change the sign of the cylinder. This gives you the NEW cylinder power.
3) Change axis by 90˚, if axis is 90˚ or less, then add 90˚. If the axis is >90˚, then subtract 90˚.

Example #1:	**+1.00**	**+1.50**	**x 170**
Step 1:	+2.50		
Step2:		-1.50	
Step 3:			x080

Example #2:	**+1.00**	**-1.75**	**x 060**
	-0.75		
		+1.75	
			x150

Measure Prism (if present)

- A prism is present when the mires cannot be centered on the central part of the reticles.
- Each black concentric ring represents 1 prism Diopter (1Δ). Count the number of circles from the center of the reticle to the center of the crossed mires.
    - If the mires (point where single/triple lines cross) are displaced towards the nose (nasally), then it is Base In prism (BI).
    - If the mires (point where single/triple lines cross) are displaced towards the temple (temporally), then it is Base Out prism (BO).
    - If the mires are displaced superiorly, then it is Base Up prism (BU).
    - If the mires are displaced inferiorly, then it is Base Down prism (BD).

Determine Optical Center

- Position the lens against the lens stop of the lensmeter.
- Focus the mires and center them within the crosshairs of the reticle.
- If available, use the lens marker (dotting device) to mark the center of the lens. If a lens marker is not available, use a non-permanent marker pen.