Ray Tracing lab Grade Sheet

1. **Drawings: / 40 points**
    a. Flat mirror
    b. Convex mirror
    c. Concave mirror
    d. Convex lens
    e. Convex lens drawing for the Incident side radius of curvature.
    f. Convex lens drawing for the refracted side radius of curvature.
    g. Concave lens
    h. Plano-convex lens

2. **Calculations: / 30 points**
    a. Calculation 1: Use the flat mirror drawing to find:
        i. The incident angle
        ii. The reflection angle
        iii. Calculate the percent difference between the angles
    b. Calculation 2: Use the convex mirror graph to find:
        i. The focal point in centimeters
        ii. The center of curvature in cm. (Show the center of curvature on your drawing)
    c. Calculation 3: Use the concave mirror graph to find:
        i. The radius of curvature in cm
        ii. The diameter of the concave mirror in cm.
    d. Calculation 4:
        i. Calculate the index of refraction for the convex lens. This value should be equal to 1.5 $\pm$ 10 %
    e. Calculation 5:
        i. Find the focal point of the concave lens in cm. Use your diagram for this.
    f. Calculation 6:
        i. Use the Plano-convex lens diagram to find the critical angle.

3. **Results:** **/ 30 points**
    a. Flat mirror:
        i. Incidence angle.
        ii. Reflection angle.
        iii. Percent difference.
    b. Convex Mirror:
        i. Focal point (cm)
        ii. Radius of curvature (cm)
    c. Concave Mirror:
        i. Radius of curvature (cm)
        ii. Diameter (cm)
    d. Convex Lens:
        i. Focal Point (cm)
        ii. Incident Side Radius of curvature (cm).
        iii. Refracted side radius of curvature (cm).
        iv. Index of refraction.
    e. Concave Lens:
        i. Focal Point (cm).
    f. Plano-Convex Lens:
        i. Critical Angle.

4. **Total** **/ 100 points**

Important things to consider

1. All drawings must be neat, clear and correctly label.
2. Write down the name of the optical piece that corresponds to each drawing on your drawing.
3. **Use a different piece of paper for each drawing.**
4. **Trace all lines using a ruler.**
5. Only use one side of the paper.
6. Sharp your pencil, erase completely, and do not cross out things.
7. Some of the calculations required that you used your drawings and add quantities to them.
8. When adding values to your drawing use a pencil, write clearly and label everything.
9. Messy work will not receive credit.