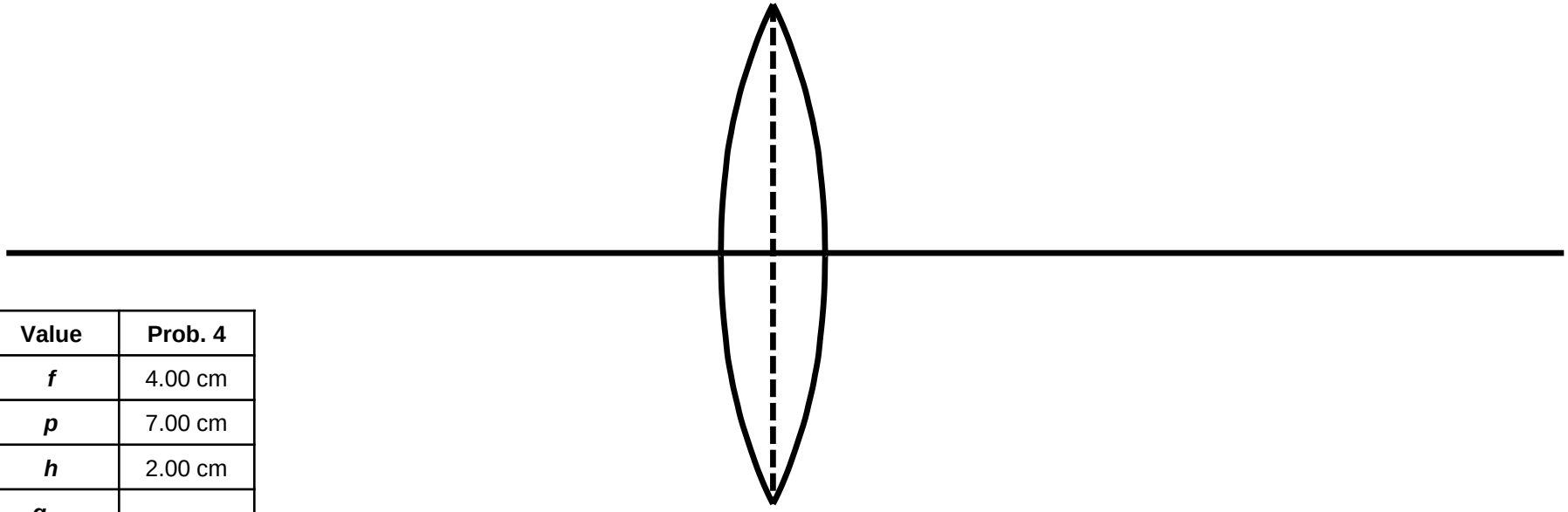
Set 2: Lenses: Ray Diagrams and Lens Calculations

Directions: For each problem, use a ruler to draw two focal points, locate the object distance, and draw the object to the correct height. Then draw a ray diagram to find the location of each image. Use the ruler to **measure** the image distance q_{ray} and image height h'_{ray}. Next, **calculate** the image distance q_{eq} and image height h_{eq} using equations discussed in class. Also, calculate the magnification M using q_{eq}. Finally, calculate the percent error of your ray diagram (rounded to the nearest 0.1%) using the equation:

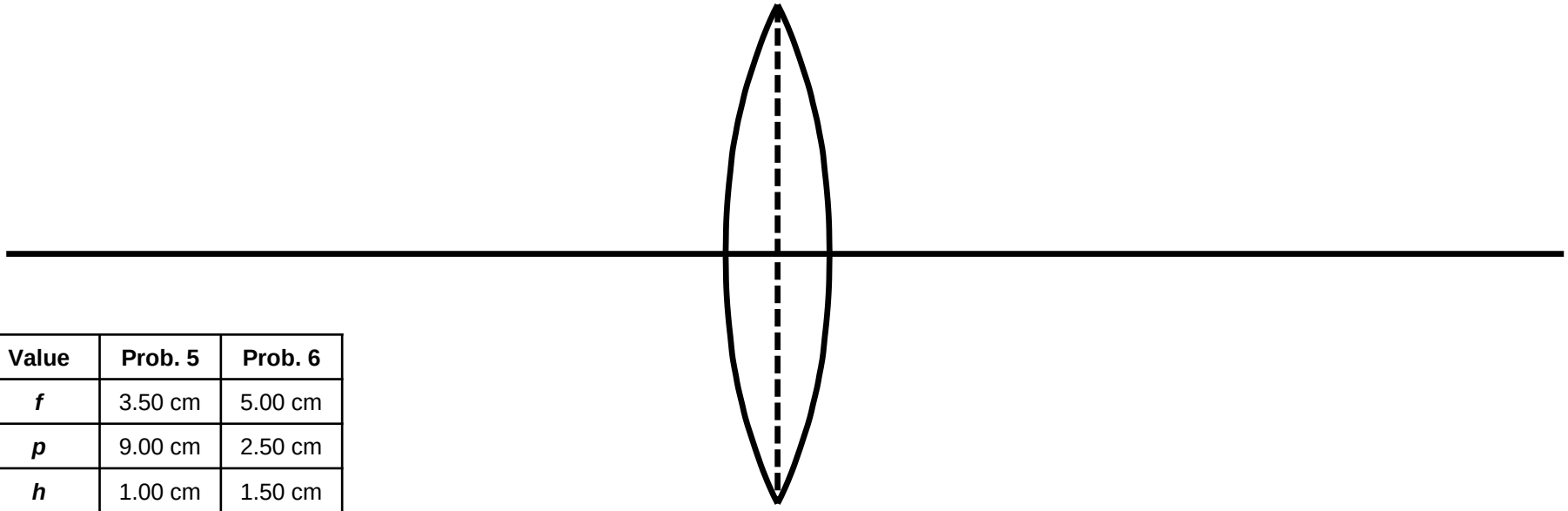
$$\% \; error = \left| \frac{q_{eq} - q_{ray}}{q_{eq}} \right| \times 100$$

4.



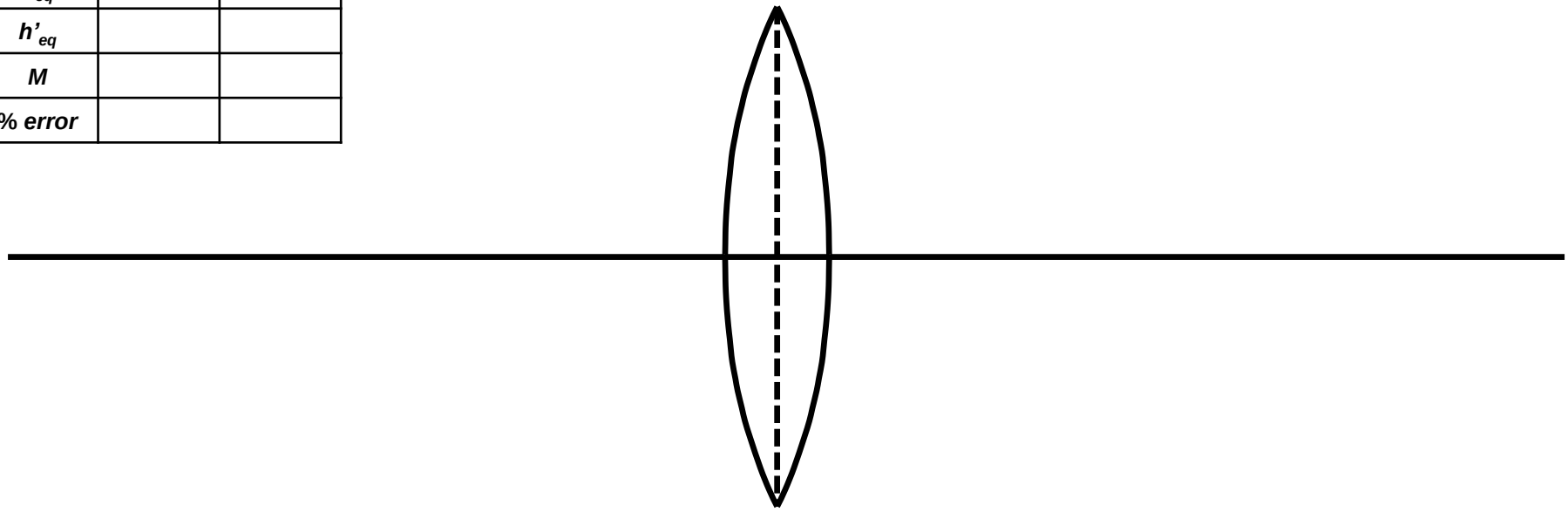
Value	Prob. 4
f	4.00 cm
p	7.00 cm
h	2.00 cm
q_{ray}	
h'_{ray}	
q_{eq}	
h'_{eq}	
M	
% *error*	

5.

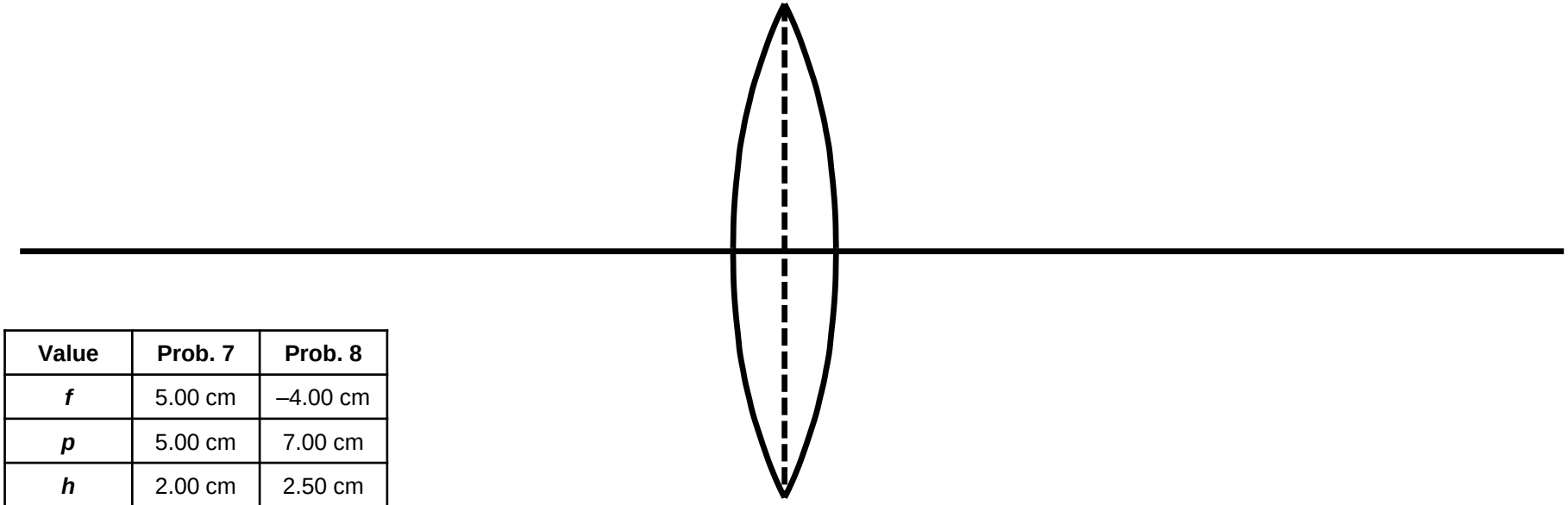


Value	Prob. 5	Prob. 6
f	3.50 cm	5.00 cm
p	9.00 cm	2.50 cm
h	1.00 cm	1.50 cm
q_{ray}		
h'_{ray}		
q_{eq}		
h'_{eq}		
M		
% error		

6.

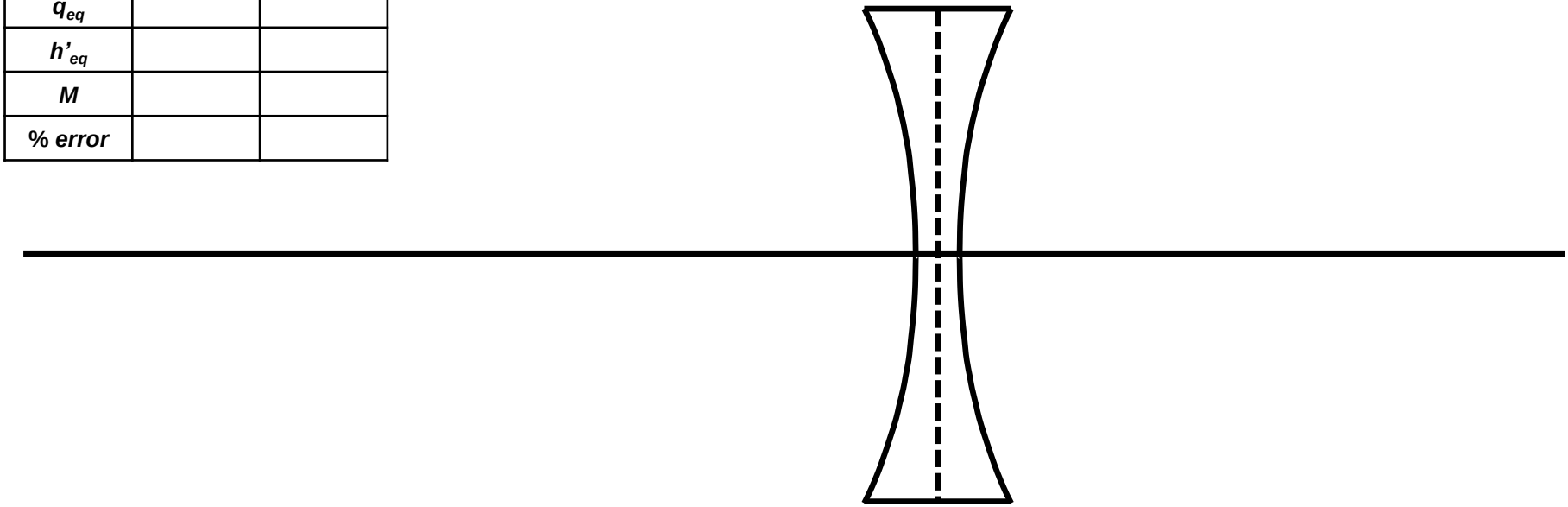


7.

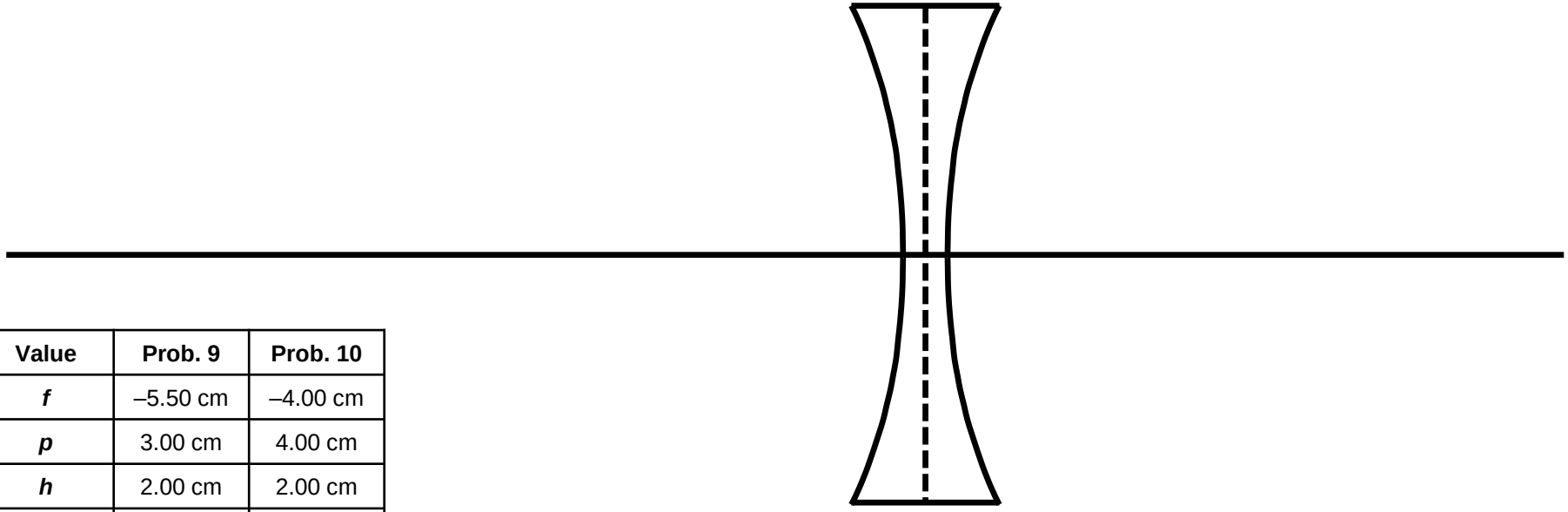


Value	Prob. 7	Prob. 8
f	5.00 cm	–4.00 cm
p	5.00 cm	7.00 cm
h	2.00 cm	2.50 cm
q_{ray}		
h'_{ray}		
q_{eq}		
h'_{eq}		
M		
% error		

8.



9.



Value	Prob. 9	Prob. 10
f	–5.50 cm	–4.00 cm
p	3.00 cm	4.00 cm
h	2.00 cm	2.00 cm
q_{ray}		
h'_{ray}		
q_{eq}		
h'_{eq}		
M		
% error		

10.