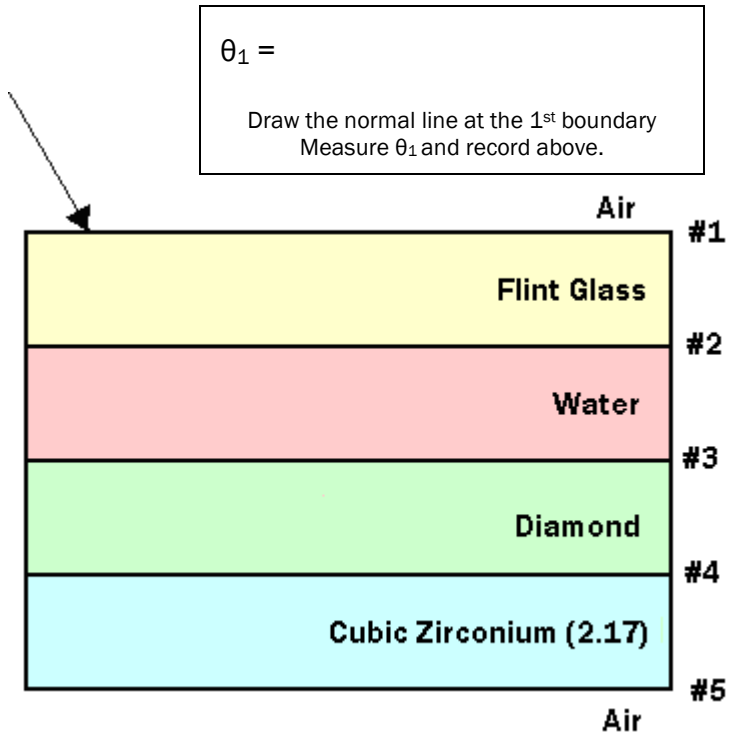


Name \_\_\_\_\_  
 Physics \_\_\_\_\_  
 Period \_\_\_\_\_

Date \_\_\_\_\_  
 Reflection/Refraction WS#6  
 Mrs. Nadworny

## Refraction

Perform the necessary calculations at each boundary in order to trace the path of the light ray through the following series of layers. Use a protractor and a ruler to draw your normal line, incident ray and refracted ray at each boundary. Show your calculations in the spaces provided. You do not need to show your givens and unknowns, only **equation, substitution** and **solution**.



$\theta_2 =$

Use  $\theta_1$  to solve for  $\theta_2$ . Draw the refracted ray using your value for  $\theta_2$ . Then draw the normal line at the 2<sup>nd</sup> boundary.

$\theta_3 =$

Use  $\theta_2$  as your incident angle in order to solve for  $\theta_3$ . Draw the refracted ray using your value for  $\theta_3$ . Then draw the normal line at the 3<sup>rd</sup> boundary.

$\theta_4 =$

Use  $\theta_3$  as your incident angle in order to solve for  $\theta_4$ . Draw the refracted ray using your value for  $\theta_4$ . Then draw the normal line at the 4<sup>th</sup> boundary.

$\theta_5 =$

Use  $\theta_4$  as your incident angle in order to solve for  $\theta_5$ . Draw the refracted ray using your value for  $\theta_5$ . Then draw the normal line at the 5<sup>th</sup> boundary.

$\theta_6 =$

Use  $\theta_5$  as your incident angle in order to solve for  $\theta_6$ . Draw the refracted ray using your value for  $\theta_6$ .

Answers in size order:  
 11.9, 13.3, 17.5, 22.0,  
 29.9, 30.0

(All answers are approximations)