



Problem 1 – Exploring the Euler Line

On page 1.3, acute $\triangle ABC$ is given. Construct the centroid, circumcenter, incenter, and the orthocenter and label them C_e , C_i , I , and O , respectively. Construct the line between points O and C_i . This line is called the **Euler Line**.

1. What do you notice about the orthocenter, O , the centroid, C_e , and the circumcenter, C_i ?
2. Move point B and answer the following question. For what type of triangle does the incenter, I , lie on the Euler Line?
3. Move point C and answer the following question: What kind of triangle guarantees that the orthocenter, O , and the circumcenter, C_i , are on the sides of $\triangle ABC$?

Problem 2 – Exploring Ratios of the Euler Line

On page 2.2, you are given $\triangle ABC$. The centroid, C , the circumcenter, R , and the orthocenter, T , are provided. Construct \overline{TR} , \overline{CR} , and \overline{CT} . Find TR , CR , and CT (remember TR means the length of \overline{TR}). Finally, calculate $\frac{TR}{CR}$.

4. What is the ratio of $\frac{TR}{CR}$?
5. How much longer is \overline{TR} than \overline{CR} ?
6. What is the ratio of CR to TR ?
7. What is the ratio of CR to CT ?