Problem 1 – Exploring the Euler Line

Start the *Cabri Jr.* application by pressing APPS and selecting **CabriJr**. Open the file *EULER* by pressing Y=, selecting **Open…**, and selecting the file. Acute triangle *ABC* is given. Construct the centroid, circumcenter, incenter, and orthocenter, and label them *C*, *R*, *I*, and *T*, respectively. Construct a line between points *T* and *R*. This line is called the Euler Line.

1. What do you notice about the orthocenter, *T*, the centroid, *C*, and the circumcenter, *R*?

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, *T*, and the circumcenter, *R*, are on the sides of $\triangle ABC$?

Problem 2 – Exploring Ratios of the Euler Line

Open the Cabri Jr. file *EULERRAT*. You are given acute 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 $\overline{\text{TR}}$ than $\overline{\text{CR}}$?

6. What is the ratio of *CR* to *TR*?

7. What is the ratio of *CR* to *CT*?