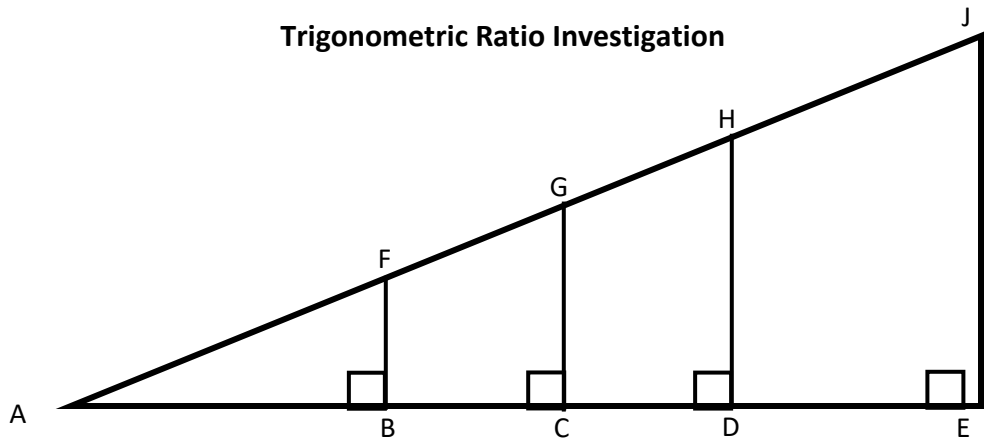
Trigonometric Ratio Investigation

90° Right Triangles



- Explain why any two of the triangles in the above image are similar. Justify your answer with a similarity shortcut.
- Make your own set of triangles that looks generally like the diagram above. Your angle A should measure 35°. **(Accuracy is very important here!!)**
- Measure the short side, the long side, and the hypotenuse of each triangle in centimeters. **(Again, accuracy matters!)**
- Label the hypotenuse of the triangles
- Label the sides that are opposite angle A as opposite.
- Label the sides that are adjacent to angle A as adjacent.
- **Relative to angle A calculate the following (Tangent):**
    - The ratio of the opposite side over the adjacent side for each of the four triangles ΔABF, ΔACG, ΔADH, ΔAEJ
    - Find the average ratio of the opposite side over the adjacent side
    - Using your calculator, evaluate tan (35°). How does this number relate to the ratio you calculated? What does this tell you about tan(35°)? What does tan(35°) represent?
- **Relative to angle A, calculate the following (Sine):**
    - The ratio of the opposite side over the hypotenuse for each of the four triangles ΔABF, ΔACG, ΔADH, ΔAEJ
    - Find the average ratio of the opposite side over the hypotenuse
    - Using your calculator, evaluate sin(35°). How does this number relate to the ratio you calculated? What does this tell you about sin(35°)? What does sin(35°) represent?
- **Relative to angle A, calculate the following (Cosine):**
    - The ratio of the adjacent side over the hypotenuse for each of the four triangles ΔABF, ΔACG, ΔADH, ΔAEJ
    - Find the average ratio of the adjacent side over the hypotenuse
    - Using your calculator, evaluate cos(35°). How does this number relate to the ratio you calculated? What does this tell you about cos(35°)? What does cos(35°) represent?
- **Summarize your findings. What do the tan, cos, sin buttons on your calculator represent?**