6.1 – Similar Polygons
Math 10 AW

Similar figures have the same shape, but are usually different sizes. Similar figures will have congruent (equal) angles and corresponding (same relative position) sides. In similar figures corresponding sides will have the same ratio or be proportional.

Are the two shapes below similar figures?

1. 
   a) What is the ratio for the lengths?
   \[ \frac{4}{6} = 1.5 \]

2. 
   b) What is the ratio for the widths?
   \[ \frac{2}{3} = 1.5 \]

3. 
   c) Is the ratio the same in both comparisons?
   YES 1.5 scale factor

4. 
   d) What do the angles have to be in each corner?
   90°

5. 
   d) Are the shapes similar to each other?
   YES
Example 2

Two houses on a cul de sac have backyards that are in the shape of a trapezoid. Based on the pictures are they similar figures?

Are the two backyards similar to each other? How can you prove this?

- Look at angles
  \[ \angle B + \angle C = 180^\circ \] lines parallel
  \[ \angle E + \angle H = 180^\circ \]

\[ \therefore \angle E = \angle A = 71^\circ \]
\[ \angle H = \angle B = 109^\circ \]

\[ \frac{EF}{AB} = \frac{20.4}{13.6} = 1.5 \]
\[ \frac{HG}{DC} = \frac{10.8}{7.2} = 1.5 \]
\[ \frac{FG}{AD} = \frac{15}{10} = 1.5 \]

Bonus: How would you find how deep the lot is?

\[ 20.4 - 10.8 = 9.6 \]
\[ 9.6 \div 2 = 4.8 \]

\[ b = \sqrt{c^2 - a^2} \]
\[ = \sqrt{15^2 - 4.8^2} \]
\[ = \sqrt{225 - 23.04} \]
\[ = \sqrt{201.96} \]
\[ = 14.2 \]