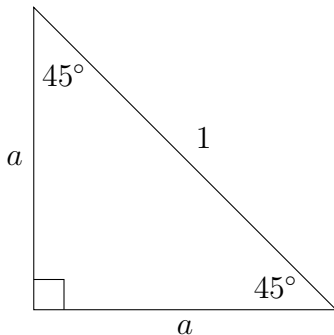


## Trigonometry

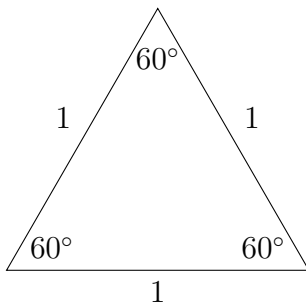
### Activity 1a - Special Triangles

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1. For the  $45^\circ - 45^\circ - 90^\circ$  triangle, (the isosceles right triangle), there are two legs of length  $a$  and the hypotenuse of length 1.



- Use the Pythagorean Theorem to write an equation relating the lengths of the sides of the triangle.
  - Solve the equation for  $a$ . (Note: Only the positive answer will make sense.)
2. To find the lengths of the legs of the  $30^\circ - 60^\circ - 90^\circ$  triangle, begin with an equilateral triangle, all of whose sides are length 1.



- From the top vertex, draw a line segment perpendicular to the bottom side, cutting the original triangle into two congruent triangles. (Geometry review: The new line segment is called the perpendicular bisector, it is also called the median, it is also called the altitude.)
  - Find the lengths of the two halves of the bottom side.
  - Find all the angles in the triangles.
  - Label the length of the altitude  $h$
  - Use the Pythagorean Theorem to write an equation involving  $h$
  - Solve the equation for  $h$ .
3. Draw the 45-45-90 triangle in as many orientations as possible, keeping the legs either horizontal or vertical. (Hint: You can rotate and reflect the triangle.)
  4. Draw the 30-60-90 triangle in as many orientations as possible, keeping the legs either horizontal or vertical.