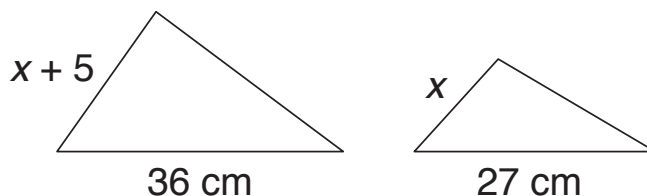


- Find the side length of an equilateral triangle with an area of $30\sqrt{3}$ m². (Get the units right.)
- These two triangles are similar. Find x and show your work.



- Find a right triangle such that the shortest leg is two units shorter than the other leg, and the other leg is two units shorter than the hypotenuse. Show that there are no other such triangles.

Extra Credit. Describe all possible right triangles whose shortest leg is two units shorter than the other leg.

4a. In class, we developed the formula $(N - 2) \cdot 180^\circ$ and the equivalent formula $N \cdot 180^\circ - 360^\circ$ for the sum of the angles of an N -sided polygon. Give one explanation for why either formula is correct.

4b. What are the angles in a regular polygon with twelve sides?

5a. Starting from facts about isosceles triangles, carefully calculate $\sin(45^\circ)$ and $\cos(45^\circ)$.

5b. Hopey is looking at a tree. Her eyes are three feet above the ground. The sight line from her eyes to the top of the tree is 100 feet. The angle the sight line forms with the horizontal is 15° . Using the fact that $\sin(15^\circ)$ is approximately 0.259, calculate the height of the tree and the Hopey's horizontal distance from the tree.

6a. I claim there is a polyhedron with 21 faces and 28 vertices. Using Euler's Formula, tell me how many edges it must have.

6b. I further claim that the faces are all pentagons. Explain why this is impossible.

7. Use the diagrams to the right to justify an area formula for parallelograms.

