

Mathematics 2260H – Geometry I: Euclidean geometry
TRENT UNIVERSITY, Winter 2011

Problem Set #7

Do polygons grow up to be froggy-ons?

Due on Monday, 28 February, 2011.

Definition. A two-dimensional region, such as a polygon, is said to be convex if, given any two points in the region, the line segment joining them is entirely contained in the region.

For example, a triangle or a square is convex, but a star- or crescent-shaped region is not.

1. Show that the sum of the interior angles of a convex polygon with $n \geq 3$ vertices is equal to $2(n - 2)$ right angles. [15]
2. Show that the sum of the interior angles of a not-necessarily-convex polygon with $n \geq 3$ vertices is equal to $2(n - 2)$ right angles. [5]

Hint: The key to both problems is to subdivide the polygon into triangles.