## Blue puzzle: Black and white circle

Question: A circle of radius $1 / 2$ is painted black and white, with the total length of the black region being 1. Show that there must be three white points that form the vertices of an equilateral triangle.

## Extensions:

(1) Is it necessarily possible to find four white points that form a square?
(2) Is it necessarily possible to find four white points that form a rectangle?

