The sum of angles in a triangle

The sum of the angles in a triangle is $180^\circ$. One way to see this is by cutting the corners off of the triangle and noticing that the three angles form a straight angle (or $180^\circ$).

What if we draw a triangle on a sphere? Would the sum of the angles still be $180^\circ$?

The diagram on the right shows a triangle formed by the equator and two lines of longitude. Consider the following:

- What are the angles formed at the equator?
- What is the third angle (approximately)?
- What is the sum of these angles?

Now draw a different triangle using the equator and two different lines of longitude. What is the sum of the angles?

Try this again with two different lines of longitude.

- Is the sum constant?
- Or, does the sum change?
  - If it changes, what is the smallest possible sum and what is the largest possible sum?