

# Area

We conclude that defect is  
a measure of equivalence!

Def: The area of any polygon is  
proportional to its defect

$$A = k \cdot D$$

$k =$  given positive  
constant

e.g.  ~~$\pi/180$~~

Thus: for any triangle,  $A < k \cdot 180$

Pf:  $A = k \cdot D = k \cdot (180 - S) < k \cdot 180$

Triangles can not be arbitrarily large!

# Elliptic Geometry

Excess:

$$E = S - 180$$

$\Rightarrow$  triangles equivalent  $\iff$  same excess

$$\Rightarrow A = K \cdot E$$

$$K = r^2 \cdot \frac{\pi}{180}$$

(solid angle!)

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Spherical: works  $\forall$  triangles, including angles  $> 180$

i.e.  $0 < E < 720$

use inequalities

Klein: can't define inside of triangle!  
 $\therefore$  only works <sup>well</sup> for convex triangles

i.e.  $0 < E < 360$

(<sup>best to assume</sup> all angles  $< 180$ )

use inequalities