Since the two angles that are not a part of the polygon add up to 80, and a quadrilateral's angles add up to 360, you can conclude that the polygon angles add up to 280, and therefore each angle in the polygon is 140.

So, we will have:

$$\frac{(n-2)\cdot 180}{n} = 140 \Rightarrow 180\cdot n - 360 = 140\cdot n \Rightarrow 40\cdot n = 360 \Rightarrow n = 9.$$

So, this polygon has 9 sides.

Answer: this polygon has 9 sides.