## Lesson 9: Use a Protractor to Measure Angles

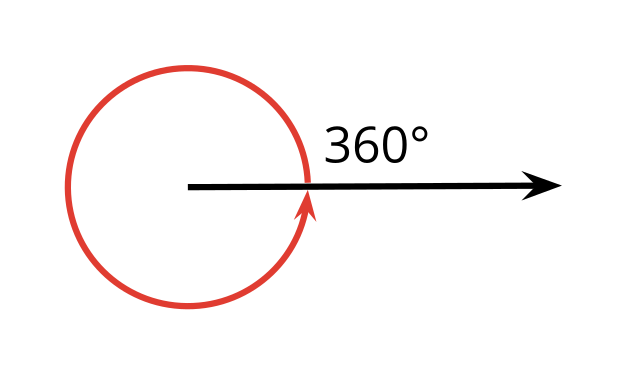
* Let’s use some tools to measure angles.

### Warm-up: True or False: There's Something about 45

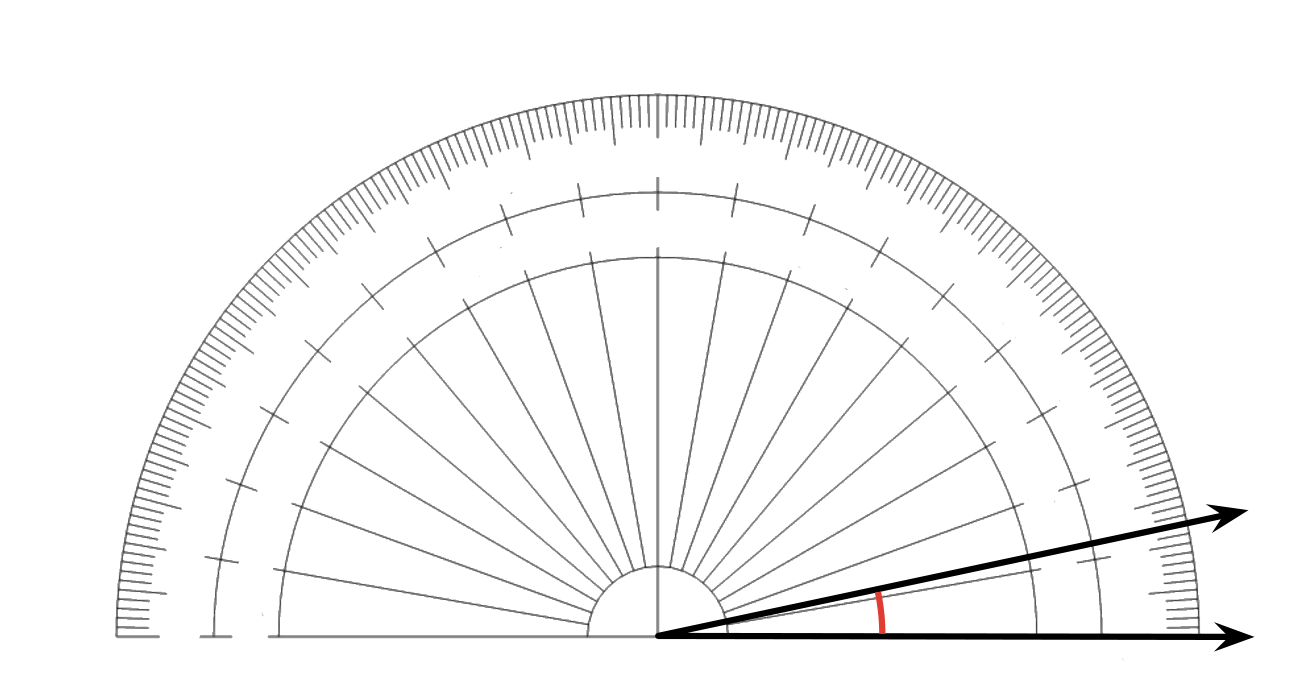
Decide if each statement is true or false. Be prepared to explain your reasoning.

### 9.1: How Large is a Angle?

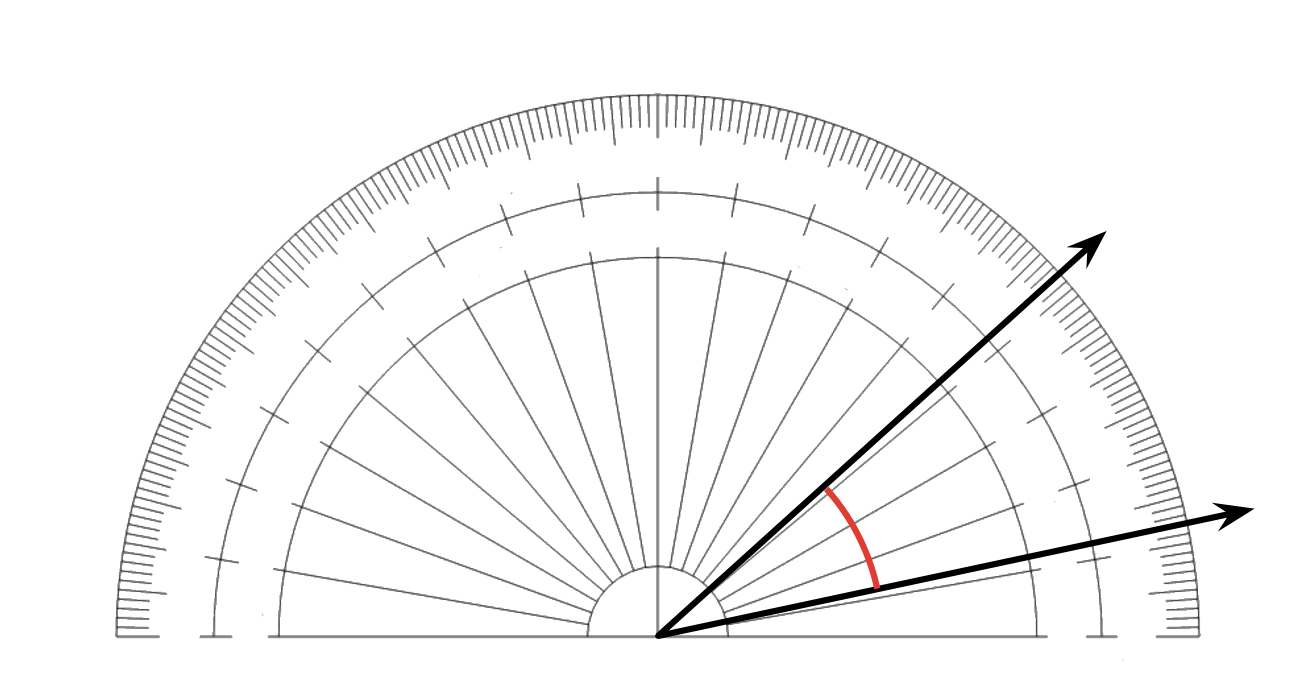
1. A ray that turns all the way around its endpoint and back to its starting place has made a full turn or has turned .

* 
* What fraction of a full turn is each of the following angle measurements?

1. Your teacher will give you a **protractor**, a tool for measuring the number of degrees in an angle.
   1. How is shown on the protractor?
   2. How many measurements do you see?
2. A protractor with no numbers has been placed over an angle.
   * The center of the protractor is lined up with the vertex of the angle.
   * The straight edge of the protractor is lined up with a ray of the angle.

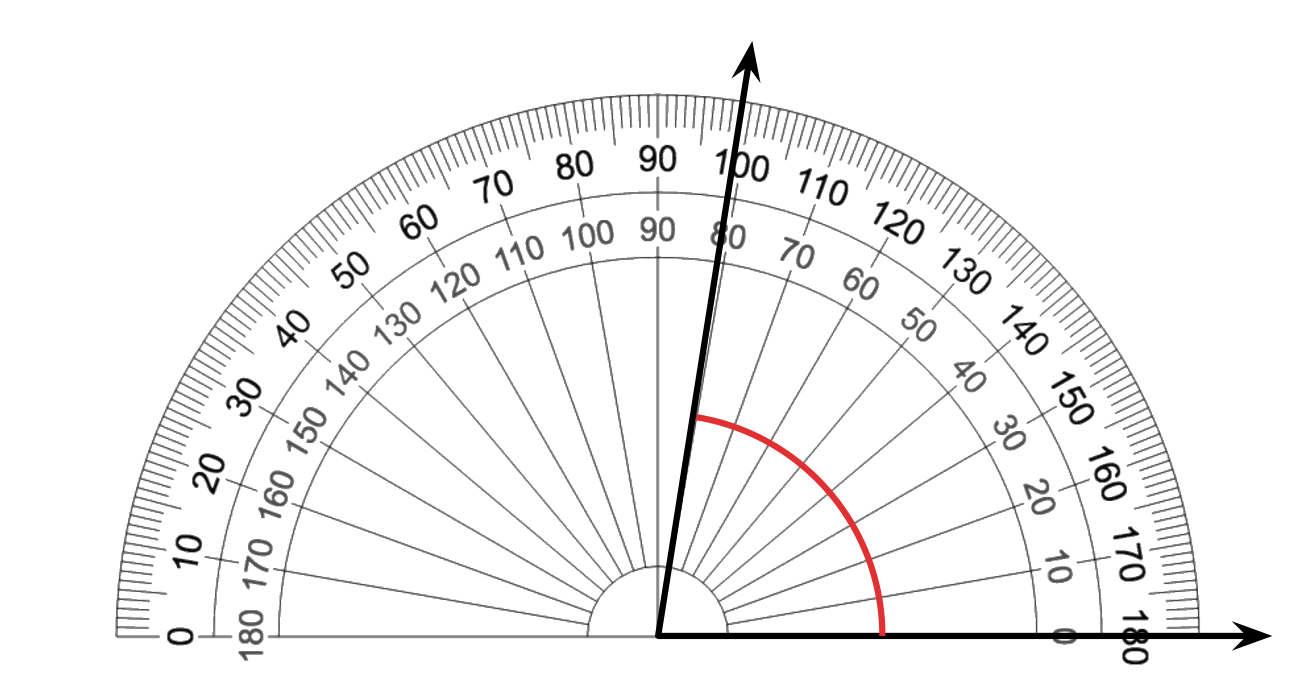
* How many degrees is this angle? Explain how you know.
* 

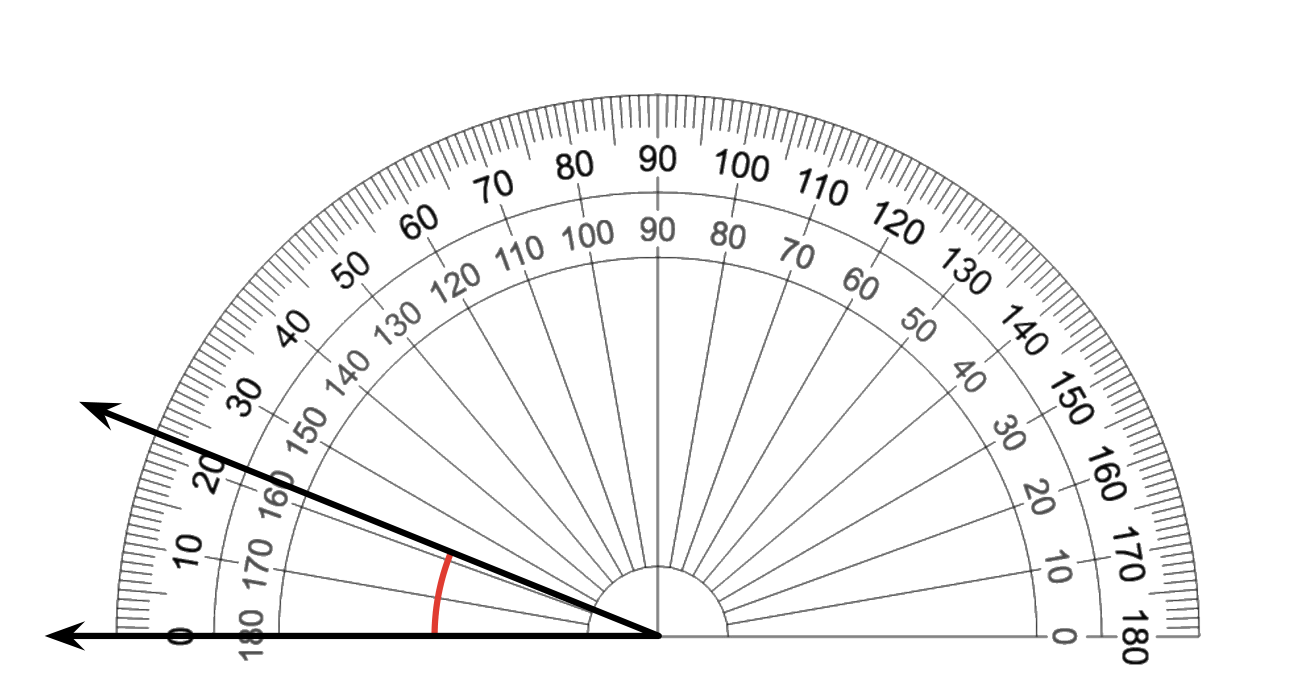
1. An angle contains thirty angles, as shown. How many degrees is this angle?

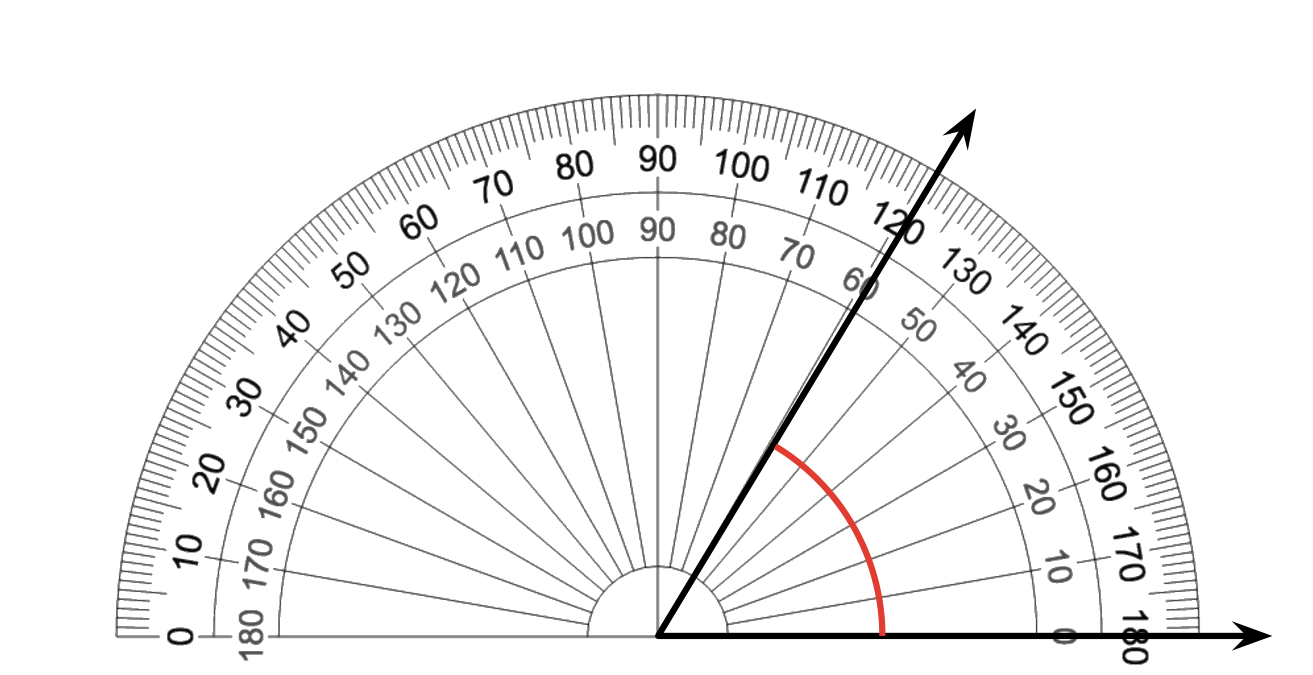
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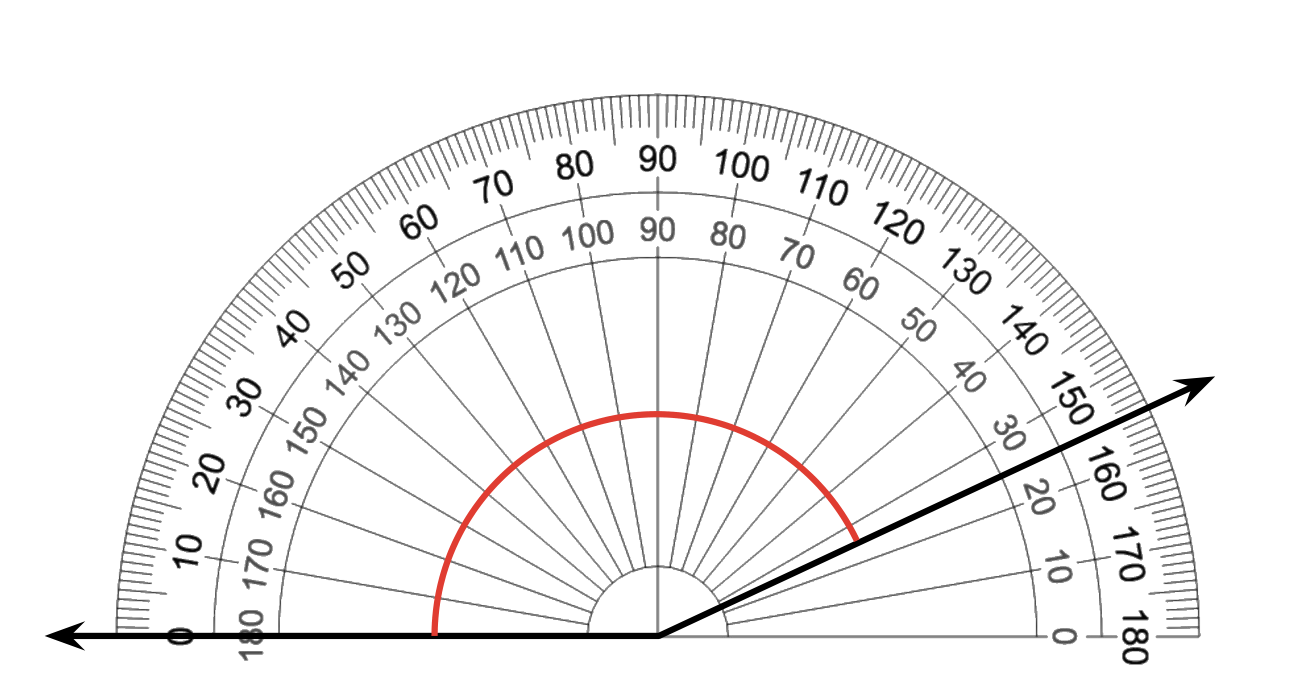
### 9.2: Use a Protractor

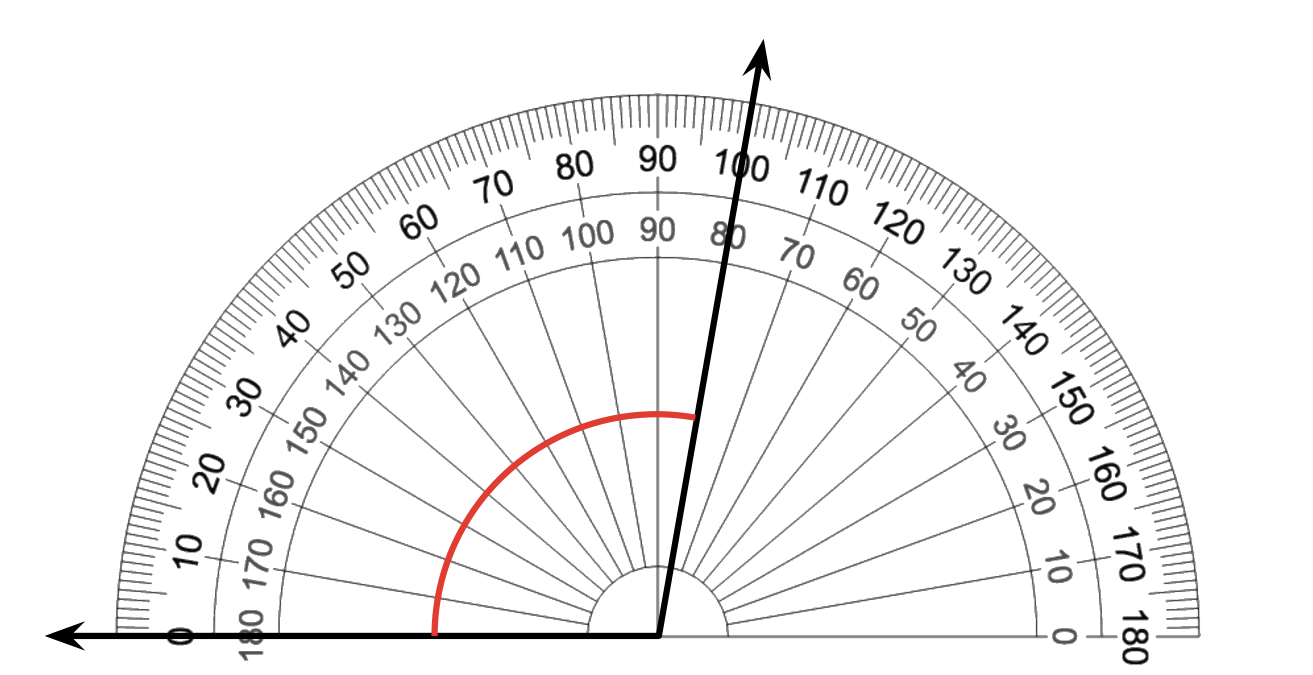
1. Here are four angles whose sizes you may have estimated earlier. A protractor has been placed over each angle. Measure the size of each angle in degrees.

   * 

   * 

   * 

   * 
2. Elena and Kiran are measuring an angle with a protractor. Elena says the angle is . Kiran says it shows . Why might they end up with different measurements? Which one is correct? Explain your reasoning.

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