

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.

•
$$2 \times 45 = 6 \times 15$$

•
$$4 \times 45 = 2 \times 90$$

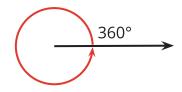
•
$$3 \times 45 = 180 - 90$$

$$\bullet$$
 6 × 45 = 45 + 90 + 135



9.1: How Large is a 1° 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 360° .



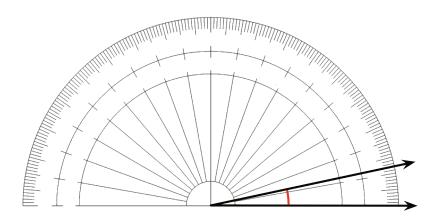
What fraction of a full turn is each of the following angle measurements?

- a. 120°
- b. 60°
- c. 45°
- d. 30°
- e. 10°
- f. 1°
- 2. Your teacher will give you a **protractor**, a tool for measuring the number of degrees in an angle.
 - a. How is 1° shown on the protractor?
 - b. How many 1° measurements do you see?

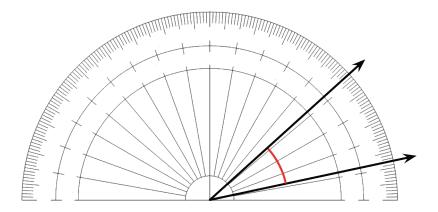


- 3. A protractor with no numbers has been placed over an angle.
 - The center of the protractor is lined up with the vertex of the angle.
 - The straight edge of the protractor is lined up with a ray of the angle.

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



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

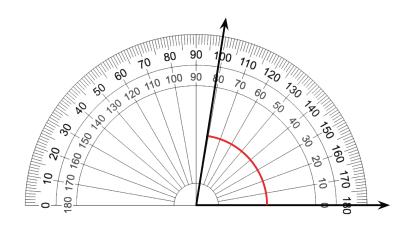




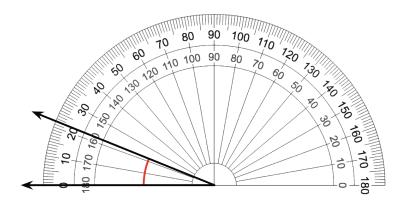
9.2: Use a Protractor

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.

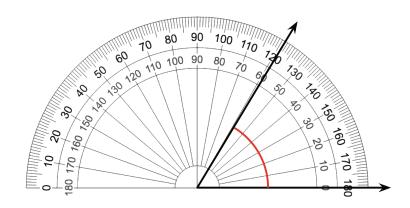
a.



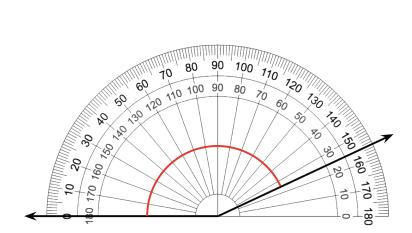
b.



c.



d.



2. Elena and Kiran are measuring an angle with a protractor. Elena says the angle is 80° . Kiran says it shows 100° . Why might they end up with different measurements? Which one is correct? Explain your reasoning.

