DRAWING ANGLES

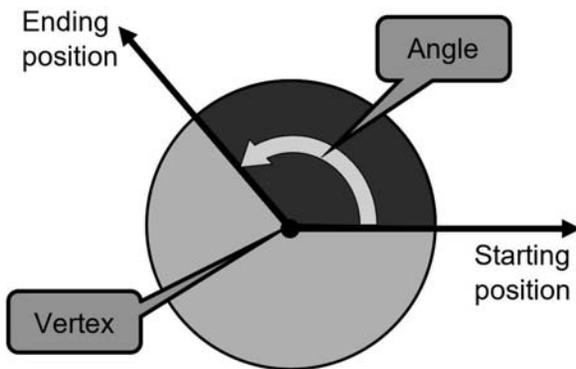**4.7D** **The student is expected to draw an angle with a given measure.**

ⓘ TELL ME MORE...

An **angle** is created by rotating a ray about its endpoint, which is the **vertex** of the angle. The degree measure of an angle is the amount of rotation between the starting position and the ending position of the ray.

Since an angle is the amount of rotation between two parts of lines, you can use a **protractor**, which is a curved number line, to measure this rotation. The angle of the triangle shown has a measure of 55° since you read up from 0 on the bottom side of the triangle to a line halfway between 50 and 60 for the second side of the triangle.
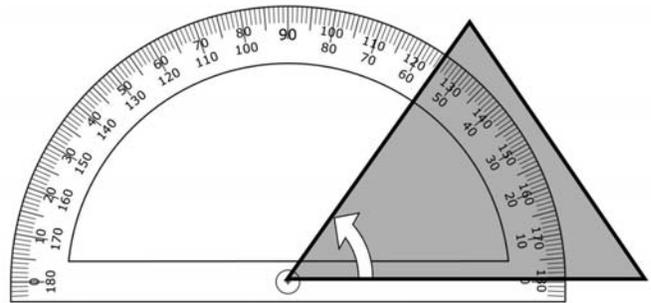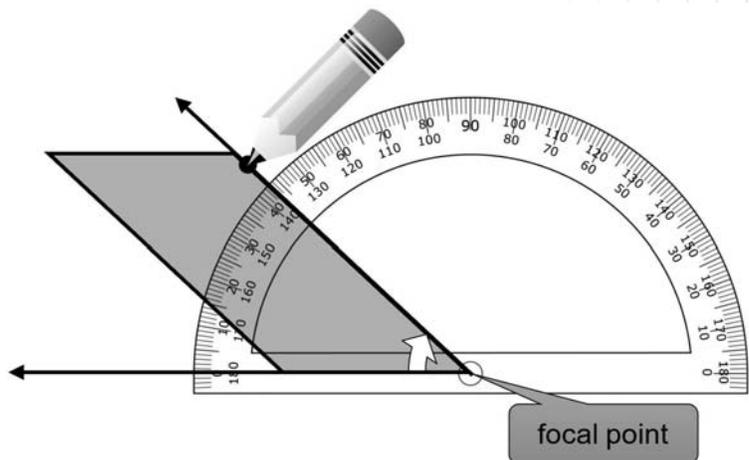

You can also use a protractor to construct an angle if you know its measure. For example, if you know that a parallelogram has an angle with a measure of 43°, you can use the protractor to draw this angle.

- Draw a horizontal ray on your paper.
- Line up the endpoint of this base ray with the focal point on your protractor.
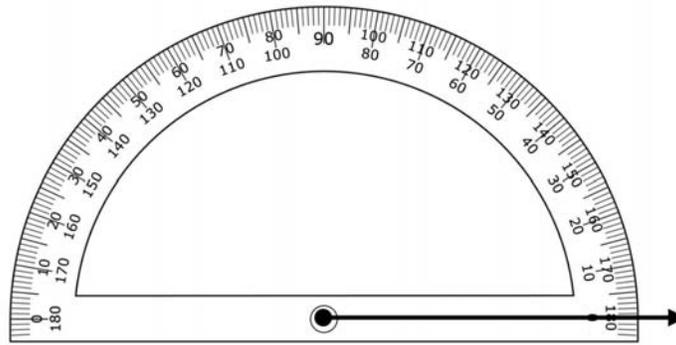- Read up to 43° of rotation and mark a point on your paper.
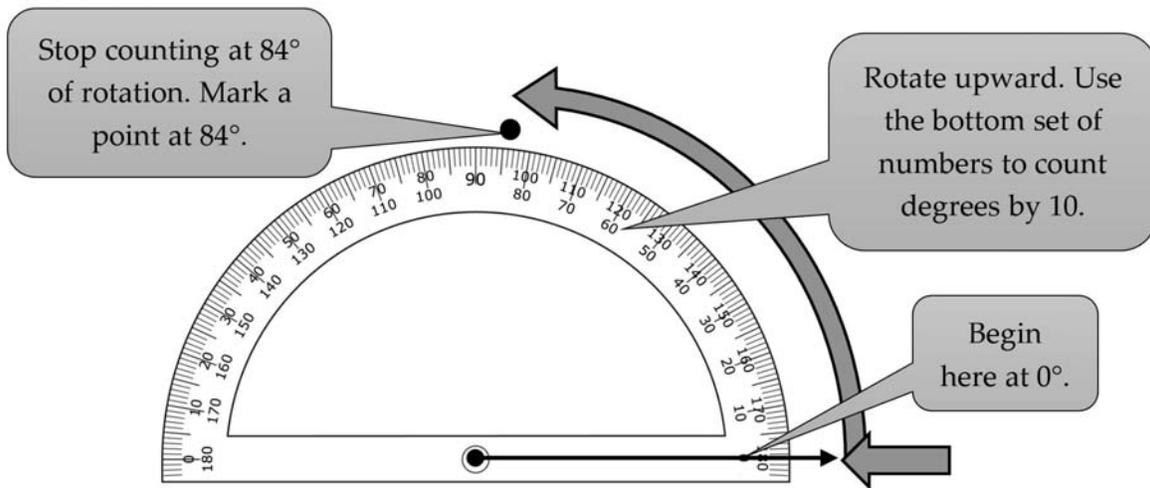- Use a straight edge to draw a new ray from the original endpoint to the new point.

focal point

EXAMPLES

EXAMPLE 1: Use a protractor to draw an angle with a measure of 84°.
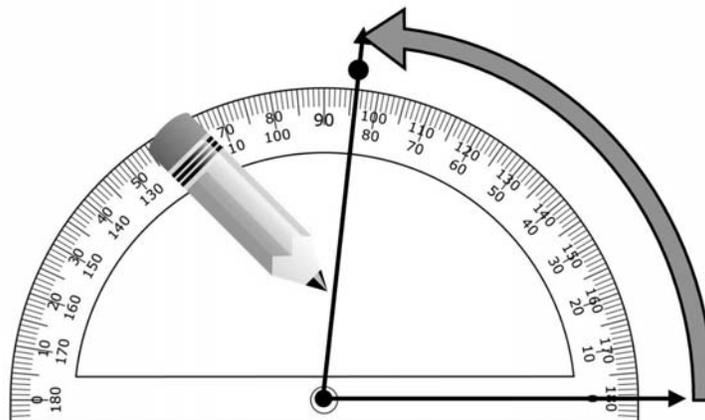
STEP 1 Draw a horizontal ray and align the ray with the baseline of the protractor.

STEP 2 Read 84° of rotation along the protractor.

Stop counting at 84° of rotation. Mark a point at 84°.

Rotate upward. Use the bottom set of numbers to count degrees by 10.
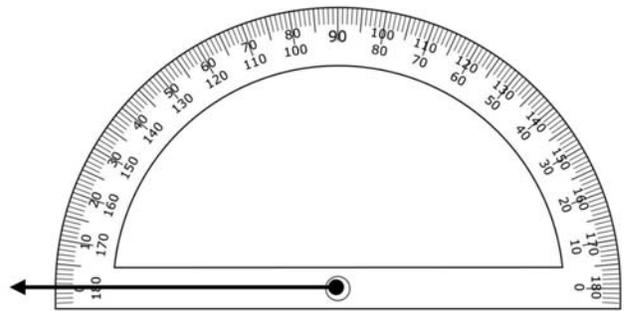
Begin here at 0°.

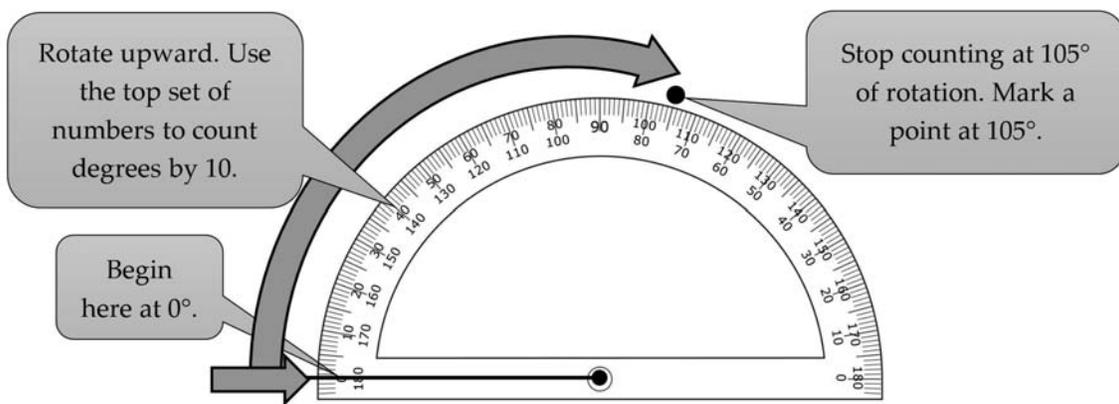**STEP 3** Use a straight edge to construct a second ray so that it creates an 84° angle.

EXAMPLE 2: The measure of one angle in obtuse triangle *GJC* is 105°. Use a protractor to construct this angle.

STEP 1   Draw a horizontal ray and align the ray with the baseline of the protractor.
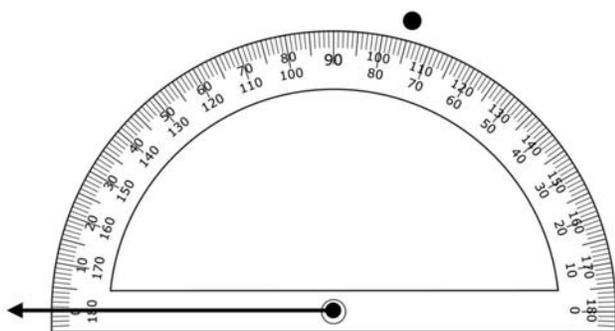
STEP 2   Read 105° of rotation along the protractor.

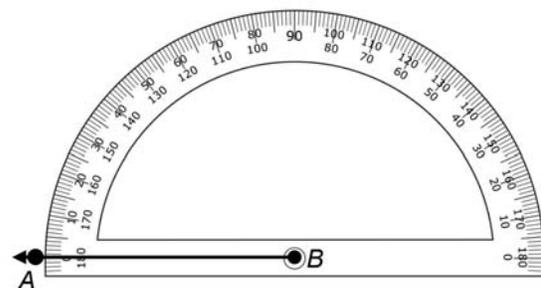Rotate upward along the protractor, counting by 10 degrees, until you reach the ending ray of the angle.

> Rotate upward. Use the top set of numbers to count degrees by 10.

> Begin here at 0°.

> Stop counting at 105° of rotation. Mark a point at 105°.

STEP 3   Use a straight edge to construct a second ray so that it creates an 105° angle.

YOU TRY IT!

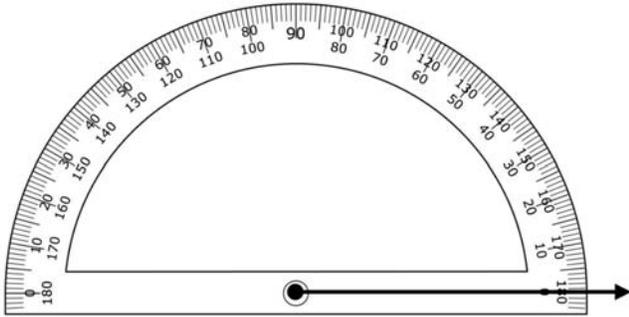Construct angle *ABC* so that the measure of angle *ABC* is 129°.

- Begin near point *A* at the 0° mark.
- Rotate upward 129° along the protractor.
- Mark point *C* at 129°.
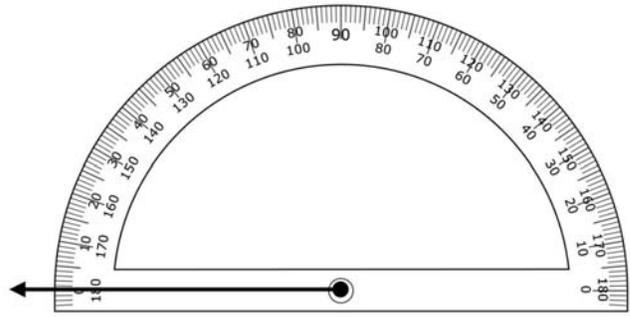- Construct ray *BC* to complete angle *ABC*.

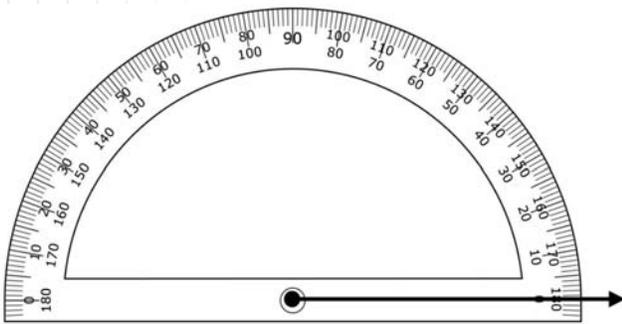*For questions 1-4, use the protractor to draw an angle with the given measure.*
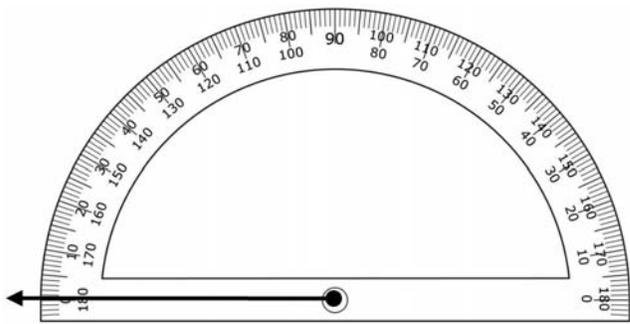
1.   72°

3.   138°

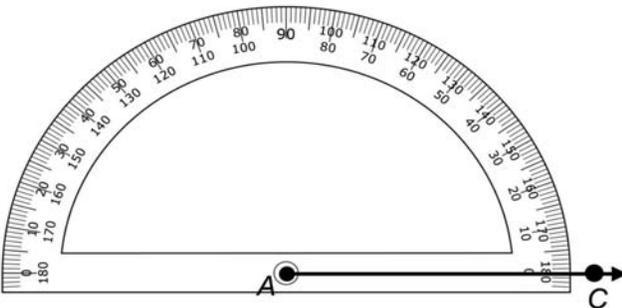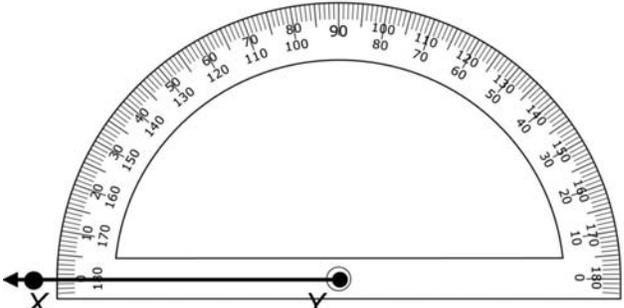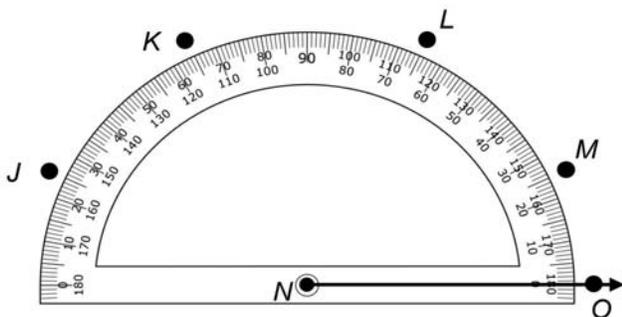**2.**   115°

4.   53°

5.   In triangle *ABC*, the measure of angle *A* is 95°. Draw angle *A* using the protractor shown.

6.   In trapezoid *WXYZ*, the measure of angle *Y* is 68°. Draw angle *Y* using the protractor shown.
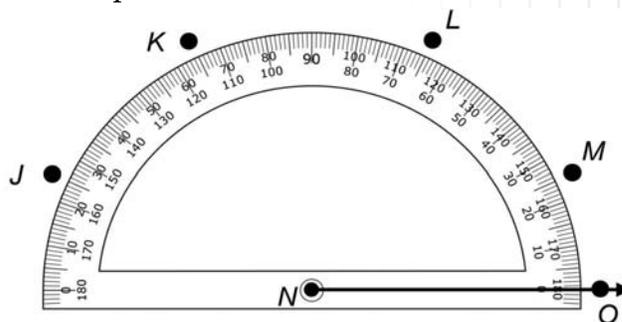
7. Yesenia is using a protractor to construct an angle that measures 25°. First, she draws ray *NO* as shown on the protractor.

To complete the 25° angle, Yesenia should draw another ray. Through which point should the ray pass?

A Point *J*

B Point *K*

C Point *L*

D Point *M*

8. Kwame used a protractor to construct an angle that measured 117°. First, he drew ray *AB* as shown on the protractor.

To complete the 117° angle, through which point did Kwame draw the second ray?

F Point *R*

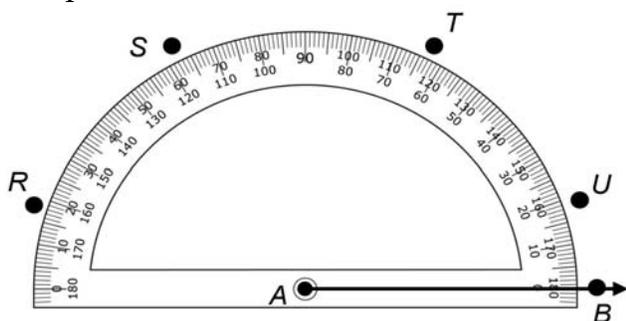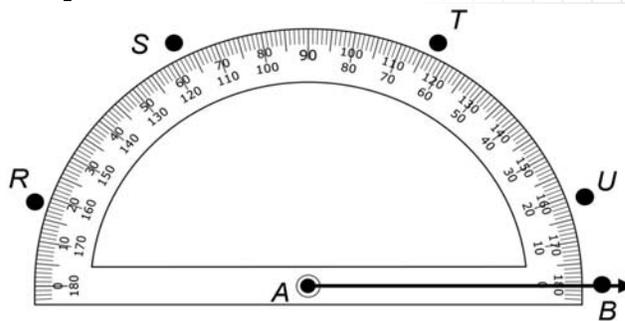**G** Point *S*

H Point *T*

J Point *U*

9. Yolanda is using a protractor to construct an angle that measures 155°. First, she draws ray *NO* as shown on the protractor.

To complete the 155° angle, Yolanda should draw another ray. Through which point should the ray pass?

A Point *J*

B Point *K*

C Point *L*

D Point *M*

10. Kenny used a protractor to construct an angle that measured 64°. First, he drew ray *AB* as shown on the protractor.

To complete the 64° angle, through which point did Kenny draw the second ray?

F Point *R*

G Point *S*

H Point *T*

J Point *U*