Measuring Angles with a Protractor

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Place the protractor center on the vertex. Align the base ray with the zero line. Start on the scale whose 0 is on that base. Read where the other ray points. Long marks are $10°$ apart; the short mark halfway between is $5°$ farther.

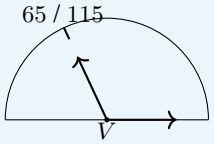
Worked example

The base points right. At the second ray, the outer reading is 65 and the inner reading is 115. Which measures the opening?

1. Put the center on V. The right-pointing base meets the inner 0 line.

2. Read the inner 115 at the second ray. This is greater than a right angle, so it fits the obtuse opening.

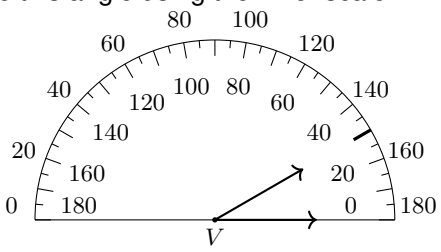
Answer: $115°$, an obtuse angle.



Practice Problems

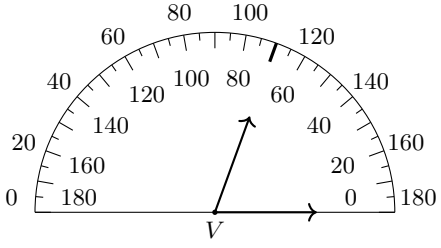
Show your thinking.

1. Measure this angle using the inner scale.



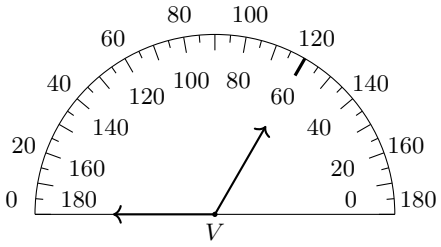
Inner: zero at right. Outer: zero at left.

2. Read the measure from the correct zero.



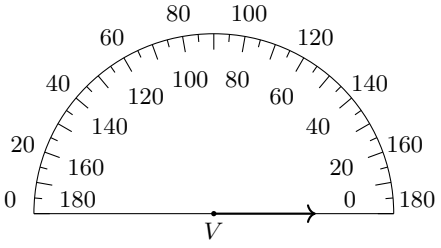
Inner: zero at right. Outer: zero at left.

3. The base ray points left. Find the angle measure.



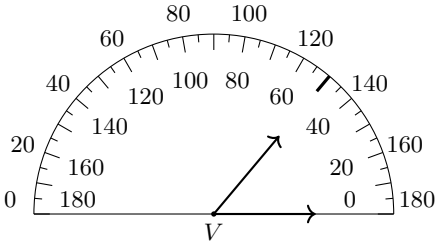
Inner: zero at right. Outer: zero at left.

4. Draw a $60°$ angle from the given base ray. Aim the ray at the tick, but stop before the numbers.



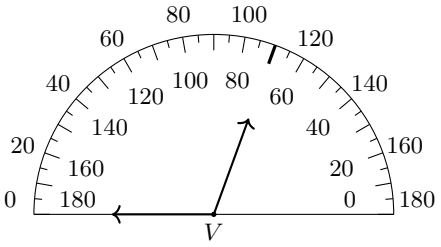
Inner: zero at right. Outer: zero at left.

5. A student reads the outer-scale 130 for this angle. Correct the reading.



Inner: zero at right. Outer: zero at left.

6. A hinged panel opens from the left-pointing base. Measure the opening.



Inner: zero at right. Outer: zero at left.

Answer Key

1. $30°$.
2. $70°$.
3. $120°$.
4. A ray from V toward the $60°$ mark on the inner scale.
5. $50°$.
6. $110°$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The base ray points right; use the inner scale whose 0 is on that ray.

2. The other ray points at the long 30 tick halfway between 20 and 40 on that scale; the opposite scale reads 150.

3. The opening is acute; $30°$ fits that size, while $150°$ measures from the other base direction.

Problem 2

1. The base ray points right; use the inner scale whose 0 is on that ray.

2. The other ray points at the long 70 tick halfway between 60 and 80 on that scale; the opposite scale reads 110.

3. The opening is acute; $70°$ fits that size, while $110°$ measures from the other base direction.

Problem 3

1. The base ray points left; use the outer scale whose 0 is on that ray.

2. The other ray points at the labeled 120 tick on that scale; the opposite scale reads 60.

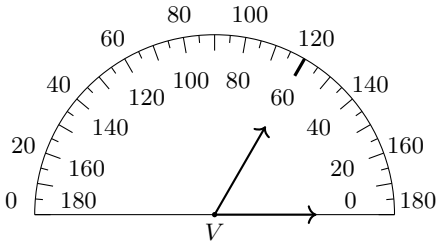
3. The opening is obtuse; $120°$ fits that size, while $60°$ measures from the other base direction.

Problem 4

1. The baseline points right; its zero is on the inner scale.

2. Locate the labeled 60 tick on the inner scale.

3. Use a ruler to line up V and that tick. Draw the ray in that direction without writing over the scale.



Inner: zero at right. Outer: zero at left.

Problem 5

1. The base ray points right; use the inner scale whose 0 is on that ray.

2. The other ray points at the long 50 tick halfway between 40 and 60 on that scale; the opposite scale reads 130.

3. The opening is acute; $50°$ fits that size, while $130°$ measures from the other base direction.

Problem 6

1. The base ray points left; use the outer scale whose 0 is on that ray.

2. The other ray points at the long 110 tick halfway between 100 and 120 on that scale; the opposite scale reads 70.

3. The opening is obtuse; $110°$ fits that size, while $70°$ measures from the other base direction.

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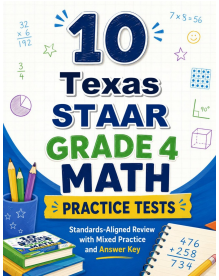

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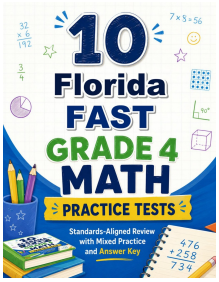

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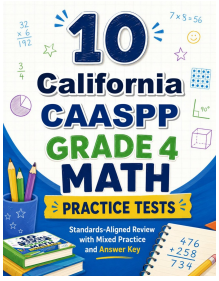

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