Measuring Angles with a Protractor

Spot mistakes, reason, and work backward

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.

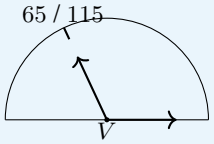
Worked example

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.

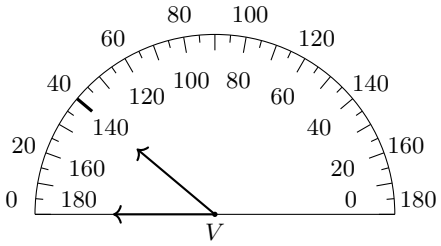
Answer: $115°$, an obtuse angle.



Practice Problems

Show your thinking.

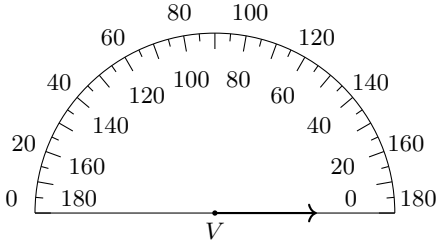
1. A child chooses the inner-scale 140. Use the base direction to repair the answer.



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

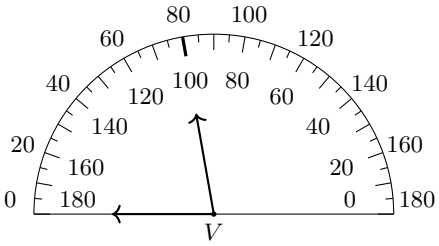
2. At a second ray the outer scale reads 40. There is a right-pointing base. Find the correct angle and name its type.

3. Draw $130°$. Name the scale. Aim the ray at the tick, but stop before the numbers.



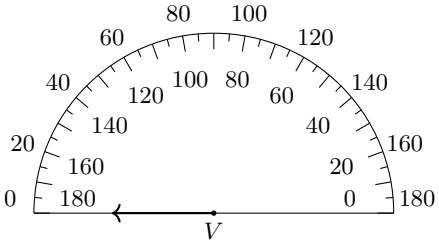
Inner: zero at right. Outer: zero at left.

4. Explain why the 100 on the other scale is not this angleś measure.



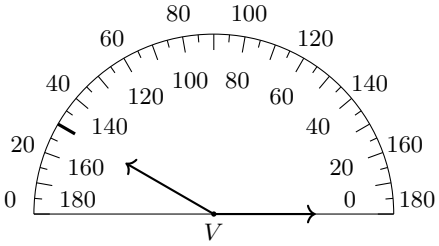
Inner: zero at right. Outer: zero at left.

5. From the left base, draw half of a right angle. Aim the ray at the tick, but stop before the numbers.



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

6. Measure the folding sign's opening. Is it obtuse?



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

Answer Key

1. $40°$.
2. $140°$; obtuse.
3. A ray from V toward the $130°$ mark on the inner scale.
4. $80°$.
5. A ray from V toward the $45°$ mark on the outer scale.
6. $150°$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

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

2. The other ray points at the labeled 40 tick on that scale; the opposite scale reads 140.

3. The opening is acute; $40°$ fits that size, while $140°$ measures from the other base direction.

Problem 2

1. The right base aligns with zero on the inner scale, so do not use the outer 40.

2. The readings at that tick add to 180. Inner reading $= 180 - 40 = 140°$.

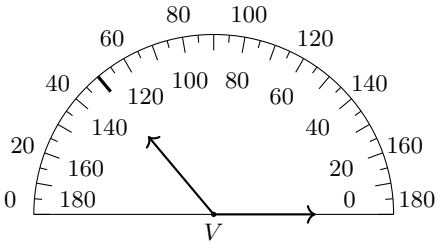
3. $140°$ is greater than $90°$ and less than $180°$, so it is obtuse.

Problem 3

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

2. Locate the long 130 tick halfway between 120 and 140 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 4

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

2. The other ray points at the labeled 80 tick on that scale; the opposite scale reads 100.

3. The opening is acute; $80°$ fits that size, while $100°$ measures from the other base direction.

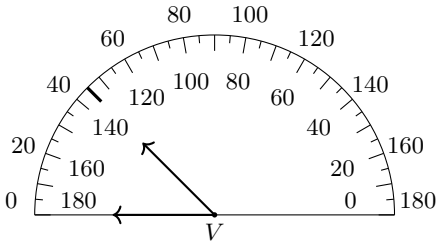
Problem 5

1. A right angle is $90°$. Half of it is $90 \div 2 = 45°$.

2. The baseline points left; its zero is on the outer scale.

3. Locate the short 45 tick between the long 40 and 50 ticks on that scale. The same position is 135 on the inner scale.

4. 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 6

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

2. The other ray points at the long 150 tick halfway between 140 and 160 on that scale; the opposite scale reads 30.

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

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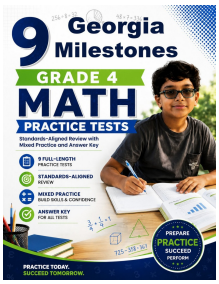

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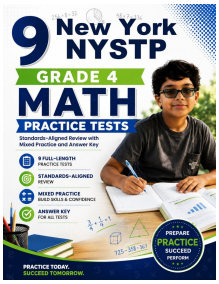

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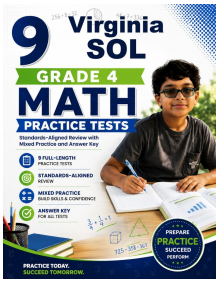

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