LESSON MAKER PRO

Angle Part Detectives

Use the shared ray to find a part or the whole.

GRADE 4 · TEKS 4.7.E

4.7.E "determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures."

NAME _____ DATE _____

Materials: a pencil. Use the measures given in each question. Show your calculation and explain or check it. The middle letter of an angle name is its vertex.

Find the non-overlapping parts

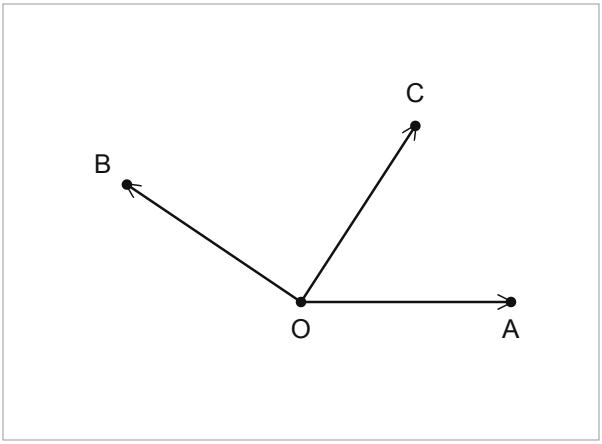
Ray OC lies between OA and OB. Angles AOC and COB share vertex O and side OC, with no overlap. Add the two parts to find AOB. Subtract a known part from AOB to find the missing part. Use the given measures, not a protractor.

Try it together

AOB is 146 degrees and AOC is 57 degrees. Find COB.

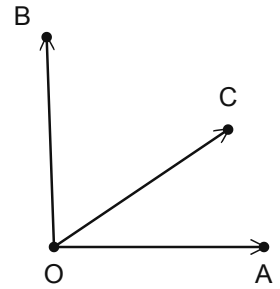
1. The internal ray OC splits the whole into AOC and COB.
2. COB = 146 - 57 = 89 degrees. Check: 57 + 89 = 146.

COB is 89 degrees.



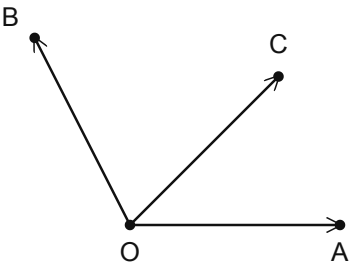
1. Find and check

AOB is 92 degrees. AOC is 34 degrees. Find COB and check your result by addition.



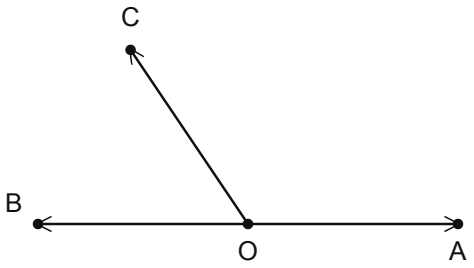
2. Add the parts

AOC is 45 degrees and COB is 72 degrees. Find the whole angle AOB. Explain why you add.



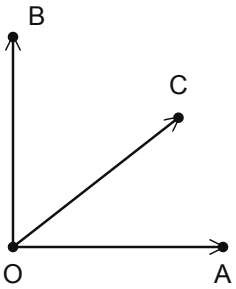
3. Use a straight angle

AOB is a straight angle. AOC is 124 degrees. Find COB. State the whole-angle measure you used.



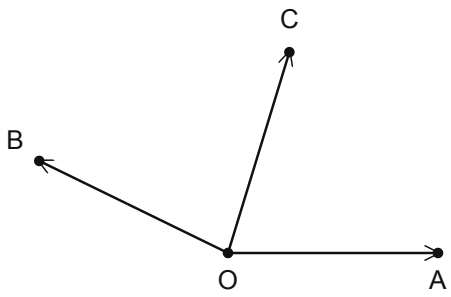
4. Use a right angle

AOB is a right angle. AOC is 38 degrees. Find COB and check the sum.



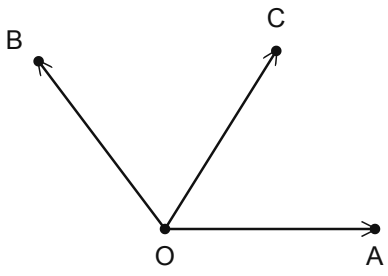
5. Connect parts and whole

An art design has AOB = 154 degrees. Its internal ray OC makes AOC = 73 degrees. Find COB and write an equation connecting both parts to the whole.



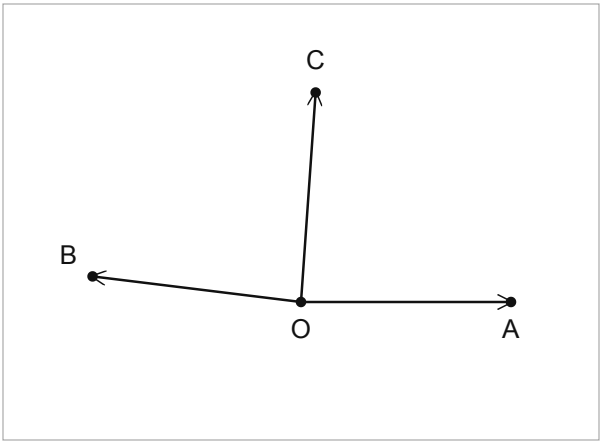
6. Explain the operation

A diagram shows AOB = 127 degrees and AOC = 58 degrees. Find COB. Explain why 127 + 58 would not answer this question.



7. Test a claim

AOB is 173 degrees and AOC is 86 degrees. Find COB. A student says it must be 86 degrees because OC looks like the middle ray. Use the given measures to explain the error.



ANSWER KEY

Angle Part Detectives

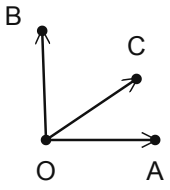
GRADE 4 · TEKS 4.7.E

Teacher notes

Each diagram shows the actual outer rays OA and OB and the shared internal ray OC. All given measures are stated in the question. Use calculation, not measurement. Require degrees and an equation or explanation. Approximate appearance does not prove that a ray bisects an angle.

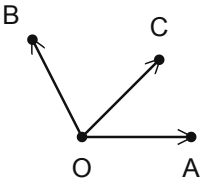
Task 1

COB = 92 - 34 = 58 degrees; 34 + 58 = 92.



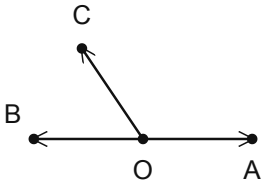
Task 2

AOB = 45 + 72 = 117 degrees. The parts are adjacent and do not overlap.



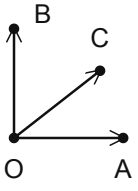
Task 3

AOB = 180 degrees; COB = 180 - 124 = 56 degrees.



Task 4

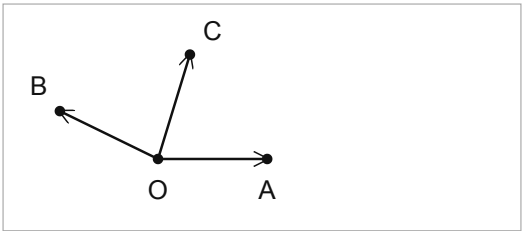
COB = 90 - 38 = 52 degrees; 38 + 52 = 90.



Task 5

COB = 81 degrees; 73 + 81 = 154.

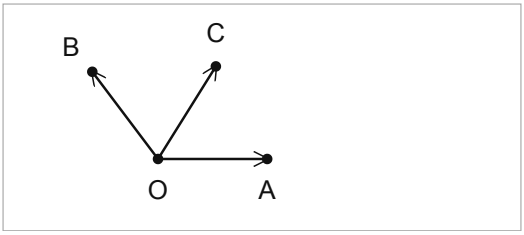
Check that the known part plus the computed part equals the given whole.



Task 6

COB = 127 - 58 = 69 degrees. Adding 58 to the whole counts that part twice.

Check that the known part plus the computed part equals the given whole.



Task 7

COB = 173 - 86 = 87 degrees. A bisector would make equal parts, but two 86-degree parts total only 172 degrees.