

Solve the Angle

Use diagrams to find missing measures

GRADE 5 • 5.MG.3.h

5.MG.3.h "Solve addition and subtraction contextual problems to determine unknown angle measures on a diagram."

NAME _____

DATE _____

BUILD UNDERSTANDING

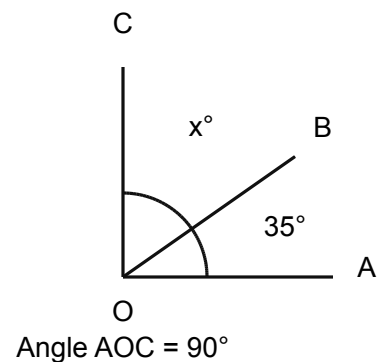
Each diagram shows adjacent angles sharing vertex O. Their parts add to the whole angle between the outer rays. Add to find a whole, or subtract known parts to find a missing part. Use the stated measures; show an equation and an answer in degrees for every task.

WORKED EXAMPLE

A camera turns from OA to OC through 90 degrees. Its first turn from OA to OB is 35 degrees. Find the remaining turn x .

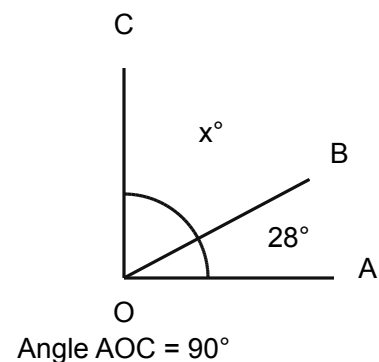
- The two adjacent turns total 90 degrees.
- $35 + x = 90$, so $x = 90 - 35$.

Answer: $x = 55$ degrees.

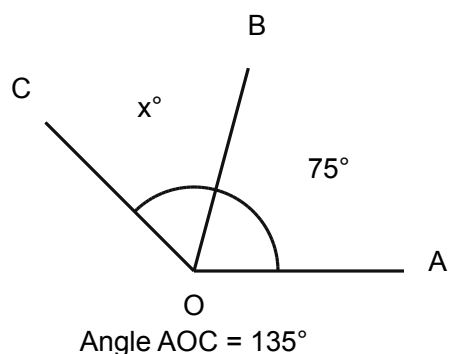


PRACTICE 4 problems

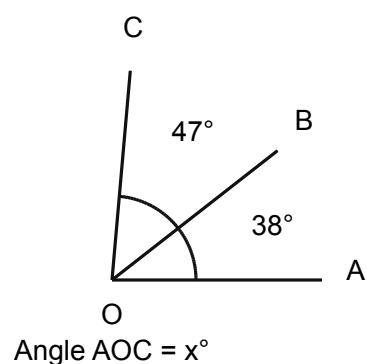
- A door opens from OA to OC through 90 degrees. OA to OB is 28 degrees. Find the remaining opening x from OB to OC.



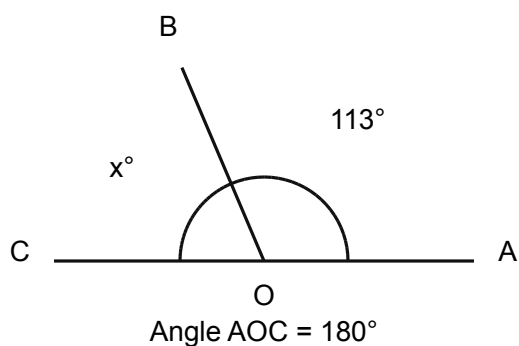
- 2** A robot turns from OA to OC through 135 degrees. The first part is 75 degrees. Find x for the second part.



- 3** A sprinkler sweeps 38 degrees from OA to OB, then 47 degrees from OB to OC. Find the whole sweep x from OA to OC.

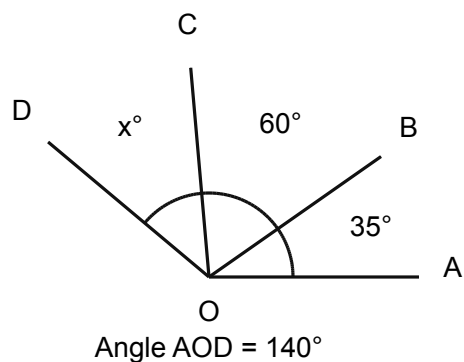


- 4** Two straight paths point in opposite directions OA and OC, making 180 degrees. A branch OB makes 113 degrees with OA. Find x between OB and OC.

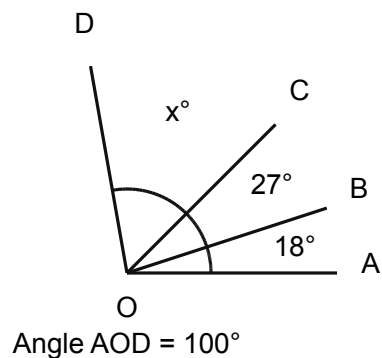


APPLY IT Show your work**1**

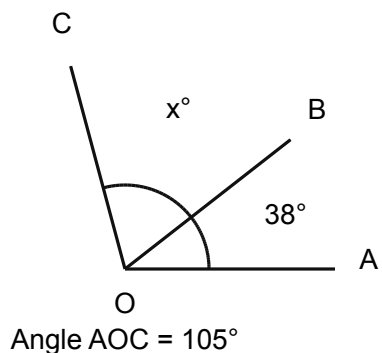
A sensor covers 140 degrees from OA to OD. Its first zone is 35 degrees and its middle zone is 60 degrees. Find the remaining zone x from OC to OD.

**2**

A folding fan opens through 100 degrees from OA to OD. Two panels cover 18 and 27 degrees. Find x for the remaining panel. Explain why adding only the two given measures does not find x .

**CHALLENGE** One step up

A stage light sweeps 105 degrees from OA to OC. Its first part is 38 degrees. Jo says the remaining part is 143 degrees. Use the diagram to correct the equation, solve x and check the whole.



Require numerical unknowns and equations, not only equation classification. Check which rays bound the given whole and each part. The physical ray directions are consistent with the stated measures; answers come from the givens, not protractor measurement. Accept equivalent addition or subtraction methods.

PRACTICE 1

$$28 + x = 90; x = 62 \text{ degrees.}$$

PRACTICE 2

$$75 + x = 135; x = 60 \text{ degrees.}$$

PRACTICE 3

$$x = 38 + 47 = 85 \text{ degrees.}$$

PRACTICE 4

$$113 + x = 180; x = 67 \text{ degrees.}$$

APPLY IT 1

$$35 + 60 + x = 140; x = 140 - 95 = 45 \text{ degrees.}$$

Accept equivalent correct reasoning with the stated units and evidence.

APPLY IT 2

$18 + 27 = 45$ degrees is the known part. $x = 100 - 45 = 55$ degrees is the remainder. Adding known panels gives the known part, not the remaining panel.

Accept equivalent correct reasoning with the stated units and evidence.

CHALLENGE

Jo added the whole and one part. $38 + x = 105$, so $x = 105 - 38 = 67$ degrees. Check: $38 + 67 = 105$ degrees.