Angle Measure as Additive

Apply the skill to decisions and designs

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

QUICK REVIEW

Adjacent, nonoverlapping angle parts add to the whole angle. If the whole is $95°$ and one part is $35°$, then $35 + x = 95$ and $x = 60°$. For a right angle the whole is $90°$; for a straight angle it is $180°$.

Worked example

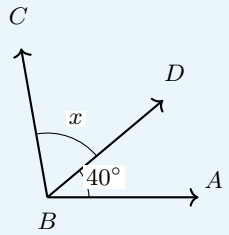
Find the unknown part of the $100°$ angle.

1. The whole is $100°$ and one part is $40°$, so $40 + x = 100$.

2. Subtract the known part: $x = 100 - 40 = 60°$.

3. Check: $40 + 60 = 100°$, recovering the full angle.

Answer: $60°$.



Whole angle $ABC = 100°$

Practice Problems

Show your thinking.

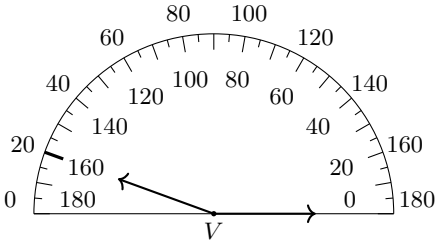
1. A fan needs two adjacent sections totaling $125°$. Each section must be at least $40°$. Which plan works: A $35°, 90°$; B $50°, 75°$; or C $60°, 70°$?

2. Four rays extend from the same point in order A, B, C, D. From A to C is $70°$, from B to D is $65°$, and from A to D is $110°$. Find the shared opening from B to C.

3. A panel has two adjacent openings. The second is $30°$ larger than the first. Together they make $110°$. Find both openings without guessing.

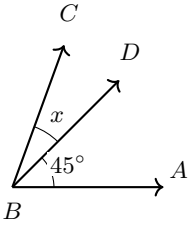
4. A right-angle corner is divided into three adjacent sections. The first two must match. The plan uses $25°$ for each, leaving at least $40°$ for the last. Will the rule still work if both first sections become $28°$?

5. Divide the shown $160°$ opening into three parts. From the right base, the first two parts must be equal and the last twice as large. Draw both dividers and label the parts.



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

6. Can a $70°$ angle contain adjacent parts $45°$ and $35°$ without overlap? Explain.



Whole angle $ABC = 70°$

Answer Key

1. Only plan B.
2. $25°$.
3. $40°$ and $70°$.
4. No. The last part would be $34°$.
5. Parts $40°, 40°, 80°$; dividers at $40°$ and $80°$.
6. No; the proposed parts total $80°$, which is $10°$ too much.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. A totals $35 + 90 = 125°$, but $35°$ is too small.

2. B totals $50 + 75 = 125°$ and both parts are at least $40°$.

3. C has two large enough parts but totals $60 + 70 = 130°$, not $125°$.

Problem 2

1. The A-to-C and B-to-D openings together cover A to D, but both include B to C.

2. Adding gives $70 + 65 = 135°$. That counts the shared part one extra time.

3. Subtract the full opening: $135 - 110 = 25°$ is the overlap.

Problem 3

1. Remove the extra $30°$ from the larger part. The two remaining equal parts total $110 - 30 = 80°$.

2. Each equal part is $80 \div 2 = 40°$. Restore the extra $30°$ to get $70°$.

3. Check $40 + 70 = 110°$ and $70 - 40 = 30°$.

Problem 4

1. Originally the last part is $90 - (25 + 25) = 40°$, just enough.

2. After the change the first two parts total $28 + 28 = 56°$.

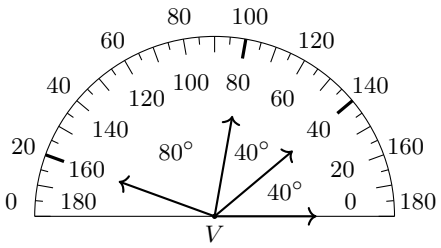
3. The last part is $90 - 56 = 34°$, which misses the $40°$ minimum.

Problem 5

1. Count equal shares: $1 + 1 + 2 = 4$ shares fill $160°$.

2. Each share is $160 \div 4 = 40°$. The last part is $2(40) = 80°$.

3. Use the inner scale from the right base. Draw at $40°$ and $40 + 40 = 80°$, then label all three parts.



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

Problem 6

1. $45 + 35 = 80°$.

2. The available opening is only $70°$.

3. $80 - 70 = 10°$; reduce a part or the parts would need overlap.

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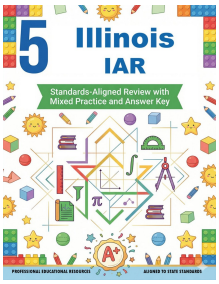

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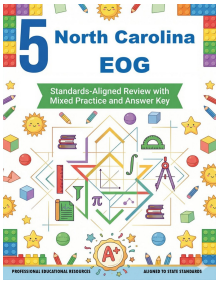

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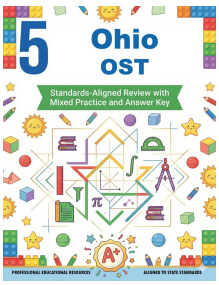

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