Angles as Geometric Shapes

Apply the skill to decisions and designs

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

QUICK REVIEW

An angle is made by two rays with one common endpoint, called the vertex. The vertex letter goes in the middle of a three-letter angle name. An acute angle is less than $90°$. A right angle is exactly $90°$; an obtuse angle is wider but less than a straight angle.

Worked example

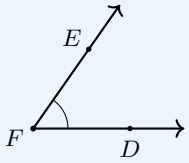
Name the angle, vertex and rays in the drawing.

1. The shared endpoint is F, so it goes in the middle: $\angle DFE$.

2. One ray starts at F and passes through D: $\overrightarrow{FD}$.

3. The other starts at F and passes through E: $\overrightarrow{FE}$.

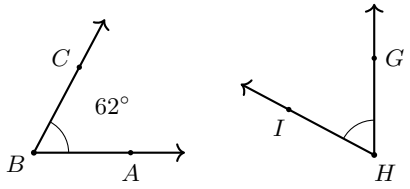
Answer: $\angle DFE$; vertex F; rays $\overrightarrow{FD}$ and $\overrightarrow{FE}$.



Practice Problems

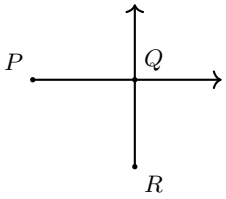
Show your thinking.

1. The right drawing is a quarter-turn copy of the left. Did the ray directions change? Did the opening change?

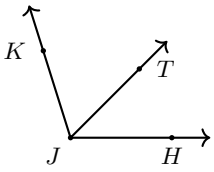


2. A shelf bracket must be a right angle. Choose between $89°, 90°, 92°$, and tell how to fix the other two.

3. The arrows show $\overrightarrow{PQ}$ and $\overrightarrow{RQ}$. A student says these rays have common endpoint Q. Explain the error and name the rays that form $\angle PQR$.

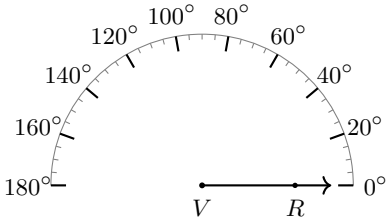


4. In the diagram, $\angle HJT$ and $\angle TJK$ touch along one ray. Name the common vertex and ray, then name the whole opening.



5. A hinged panel must open past a right angle but stop before $145°$. Which of $88°, 90°, 135°, 155°$ can be its setting?

6. Use the printed scale to design an angle wider than $100°$ but narrower than $140°$. Draw a ray from V, label S on it, and name the angle.



Answer Key

1. The directions changed. The opening stayed $62°$.
2. Choose $90°$. Open $89°$ by $1°$; close $92°$ by $2°$.
3. Q is a crossing, not their endpoint. Use $\overrightarrow{QP}$ and $\overrightarrow{QR}$.
4. Vertex J; common ray $\overrightarrow{JT}$; whole angle $\angle HJK$ or $\angle KJH$.
5. Only $135°$.
6. Example: $\angle RVS$ with opening $120°$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The left angle opens $62°$. Its bottom ray points right.

2. The quarter turn points that ray up and turns the other ray by the same amount.

3. The rays turn together, so the opening between them remains $62°$.

Problem 2

1. Only $90°$ is exactly a right angle.

2. $90 - 89 = 1$, so increase the smaller opening by $1°$.

3. $92 - 90 = 2$, so decrease the larger opening by $2°$.

Problem 3

1. The shown rays begin at P and R. Both pass through Q but do not start there.

2. The angle name PQR has middle letter Q.

3. Start both new rays at Q, one toward P and one toward R.

Problem 4

1. Both angle names have J in the middle; it is their shared vertex.

2. Both small angles have a side through T from J: $\overrightarrow{JT}$.

3. The two outside rays pass through H and K, so the whole opening is $\angle HJK$.

Problem 5

1. Past a right angle means strictly above $90°$. Reject $88°$ and $90°$.

2. Before $145°$ means strictly below $145°$. Reject $155°$.

3. $90 < 135 < 145$, so $135°$ meets both limits.

Problem 6

1. Choose $120°$ because $100 < 120 < 140$.

2. Start at the $0°$ tick on the right and follow the scale counterclockwise to $120°$. Draw a ray from V through that tick and label a point S.

3. Both rays start at V, so write $\angle RVS$ with V in the middle.

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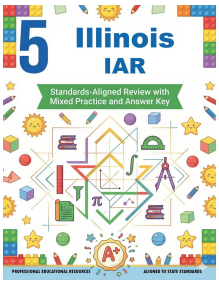

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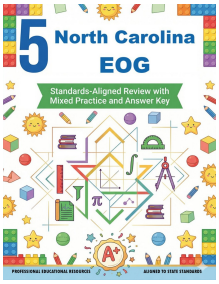

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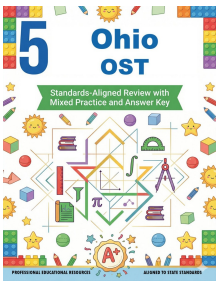

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