

Anchor Paper Scoring and Rationales - Task: Designing Windows

Name: Student A

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates an understanding of the concepts and skills associated with the task. The student uses their understanding of right angle measures to help determine unknown angle measures. The student finds the correct angle measures for the shaded shape by applying the concept of the sum of the interior angles totaling 180 degrees.
Problem Solving	Proficient	The student's strategy of cutting and folding the original square in order to compare the unknown angle measure to the 90 degree angle of his desk shows an understanding of the underlying mathematical concept. The student produces a solution that is relevant to the problem.
Communication and Reasoning	Developing	The student's reasoning is limited to the justification of 90 degree angles. The student uses limited mathematical language (90 degree angle, 180 degrees, and triangle). The student score could move to Proficient by communicating solution steps and using precise mathematical language to express ideas (isosceles triangle, acute angle, sum of the interior angles).
Representations and Connections	Developing	The student's labeling of angles is incomplete or limited to the shaded shape. The student makes a partial mathematical connection such as "This is a 90 degree angle because it is the same as the corner of my desk." The student score could move to Proficient by accurately labeling more angles.

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Name: Student B

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Developing	The student demonstrates a partial understanding of the concepts and skills associated with the task. The student uses their understanding of the interior sums of a triangle totaling 180 degrees to lead their thinking to an incorrect solution for the shaded shape.
Problem Solving	Developing	The student's strategy of dividing 180 degrees by 3 to find the shaded shape's angle measures displays a limited understanding of the underlying math concept. The student's solution is relevant to the problem but is not reasonable for the shaded shape.
Communication and Reasoning	Developing	The student's reasoning contains misconceptions pertaining to the sum of the interior angles of the shaded shape all being equal. The student uses limited mathematical language to partially communicate thinking (90 degree angle, sum is 180 degrees)
Representations and Connections	Developing	The student's labeling of angles is incomplete and contains some inaccurate measures. The student makes a partial mathematical connection by knowing the sum of the unknown angles within the shaded shape must equal 180 degrees.

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Name: Student C

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates an understanding of the concepts and skills associated with the task. The student uses their understanding of circles measuring 360 degrees to determine the 4 center angle measures of 90 degrees. The student finds the correct angle measures throughout the square window by applying their knowledge of circles to determine unknown angle measurements.
Problem Solving	Proficient	The student's strategy of finding unknown angle measures by using their knowledge of circles displays an understanding of the underlying mathematical concept. The student's solution is relevant to the problem and confirms the reasonableness of the solution.
Communication and Reasoning	Developing	The student's reasoning justifies the solution for finding the correct angle measures of the shaded shape. However, the student uses limited mathematical language to partially communicate thinking (360 degree in a circle, half is like a protractor 180 degrees, 90 degrees). The student could move to a score of Proficient by supporting arguments with precise mathematical language: <ul style="list-style-type: none"> • "I divided 360 degrees by 4 since I know that these angles are all an equal part of a circle." • "The remaining angle measures in the triangle are 45 degrees because the sum of the interior angles of a triangle is 180 degrees." • "I know this is true because these 2 angles add up to 180 degrees."
Representations and Connections	Proficient	The student's labeling of angles is accurate. The student makes relevant mathematical connections that are relevant to the context of the problem such as, "One side is half of a circle, like a protractor 180 degrees and the other side is another protractor 180 degrees, so all equal 360 degrees" and " $90+45 \times 2=180$ ".

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Name: Student D

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates an understanding of the concepts and skills associated with the task. The student uses their understanding right angles to locate other right angles within the square window. The student finds the correct angle measures throughout the square window by applying their knowledge of straight angles equaling 180 degrees to determine unknown angle measurements.
Problem Solving	Proficient	The student's strategy of finding right angles and using straight angle measures to find unknown angle measures displays an understanding of the underlying mathematical concept. The student's solution is relevant to the problem and confirms the reasonableness of the solution.
Communication and Reasoning	Developing	The student's reasoning justifies the solution for finding the correct angle measures of the shaded shape and within the square window. The student uses limited mathematical language to partially communicate thinking. The student could move to a score of Proficient by supporting arguments with precise mathematical language such as: <ul style="list-style-type: none"> • "I found all of the right angle measures first. Next, I found the missing angle measures for the straight angles by subtracting the known angle from 180 degrees." • "I know the sum of the interior angles of a triangle is 180 degrees, so I added $90+45+45$ to prove that the angle measures are correct."
Representations and Connections	Proficient	The student's labeling of angles is accurate. The student makes mathematical connections that are relevant to the context of the problem such as, " $90+45+45=180$ " and uses the correct representation for right angles.

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Name: Student E

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Developing	The student demonstrates a partial understanding of the concepts and skills associated with the task. The student uses their understanding of the sum of the interior angles of a triangle equaling 180 degrees to incorrectly determine the interior angle measures for the shaded shape. The student finds some correct angle measures throughout the square window by applying their knowledge of straight angles equaling 180 degrees to determine unknown angle measurements.
Problem Solving	Developing	The student's strategy of finding missing angles measures based off of the sum of the interior angles of a triangle displays a limited understanding of the underlying mathematical concept. The student's solution is relevant to the problem but is not reasonable for the shaded shape.
Communication and Reasoning	Developing	The student's reasoning contains misconceptions pertaining to the sum of the interior angles of the shaded shape. The student uses limited mathematical language to partially communicate thinking (right angle, $180/3=60$). The student uses limited mathematical language to incorrectly communicate thinking (equilateral triangle).
Representations and Connections	Developing	The student's labeling of angles is incomplete and contains some inaccurate measures. The student makes a partial mathematical connection by knowing the sum of the unknown angles within the shaded shape must equal 180 degrees.

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Name: Student F

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates an understanding of the concepts and skills associated with the task. The student uses their understanding right angles to locate other right angles within the square window. The student finds the correct angle measures throughout the square window by applying their knowledge of straight angles equaling 180 degrees to determine unknown angle measurements.
Problem Solving	Proficient	The student's strategy of finding right angles and using straight angle measures to find unknown angle measures displays an understanding of the underlying mathematical concept. The student's solution is relevant to the problem and confirms the reasonableness of the solution.
Communication and Reasoning	Developing	The student's reasoning justifies the solution for finding the correct angle measures of the shaded shape and within the square window. The student uses limited mathematical language to partially communicate thinking. The student could move to a score of Proficient by supporting arguments with precise mathematical language such as: <ul style="list-style-type: none"> • "I found all of the right angle measures first. Next, I found the missing angle measures for the straight angles by subtracting the known angle from 180 degrees." • "I know the sum of the interior angles of a triangle is 180 degrees, so I added $90+45+45$ to prove that the angle measures are correct."
Representations and Connections	Developing	The student's labeling of angles is accurate. The student makes mathematical connections that are relevant to the context of the problem such as, " $90+45+45=180$ " and uses the correct representation for right angles.