Assessment : End-of-Unit Assessment

Problem 1

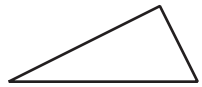
Students identify right triangles. Students may select A or E if they see the right angles but do not identify that the shapes are quadrilaterals. They may fail to select B because the right angle is not oriented in the horizontal and vertical direction. Students who select C have likely misread the question or do not understand the meaning of a right triangle. If students use a protractor to measure angles, they may not choose B or D because they may get a measurement close to but not equal to 90 degrees. This is an acceptable response but a personal interview with the student would be needed to identify this line of reasoning.

Statement

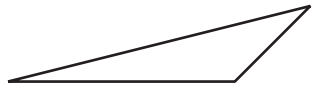
Select **all** right triangles.

A.

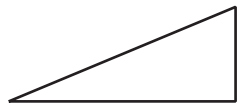
B.



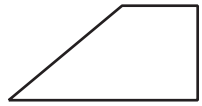
C.



D.



E.



Solution

["B", "D"]

Aligned Standards

4.G.A.2

Problem 2

This item examines right triangles from the point of view of symmetry. Students may select A if they draw a few right triangles but do not consider the situation where the sides making the right angle are equal. They may select C if they draw one or more isosceles right triangles. Like response C, response D likely means that students drew one or more specific triangles and made the wrong conclusion.

Statement

Which statement is true?

A. A right triangle never has a line of symmetry.

B. A right triangle sometimes has a line of symmetry.

C. A right triangle always has a line of symmetry.

D. If a triangle has a line of symmetry then it is a right triangle.

Solution

B

Aligned Standards

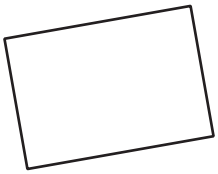
4.G.A.2, 4.G.A.3

Problem 3

Students use the properties of rhombuses, squares, and rectangles to decide if given shapes belong to these categories. Side lengths which appear to be equal are equal and angles which appear to be right angles are right angles. Students can make these assumptions or they can measure the angles and side lengths. If they measure the angles on the rectangle, however, they could get measurements such as 89 or 91. If they do and say that it is not a rectangle, this is acceptable. They could also try to measure the sides of the rhombus and think that they are not exactly equal and conclude that it is not a rhombus. As long as they show their reasoning, this is also acceptable.

Statement

1. Is the shape a rhombus? Is it a rectangle? Explain how you know.



2. Is the shape a rhombus? Is it a square? Explain how you know.

Solution

1. It is a rectangle because it has 4 right angles. It is not a rhombus because the side lengths are not all the same.
2. It is a rhombus because it has 4 sides that are all the same length. It is not a square because the angles are not right angles.

Aligned Standards

4.G.A.2

Problem 4

Students evaluate statements about quadrilaterals. The statements are about the focal points of the standard 4.G.A.2, angles of different measure and parallel lines. Students may select A if they do not read the statement carefully as some rhombuses do have a right angle. Students who select E need more work with the different types of angles. Students who do not select B, C, or D should be encouraged to draw and study specific examples of rhombuses and rectangles to help familiarize themselves with their properties.

Statement

Select **all** true statements.

A. All rhombuses have a right angle.

B. All rectangles have a right angle.

C. Lines containing opposite sides of rectangles are parallel.

D. Some rhombuses have an obtuse angle.

E. Some rectangles have an obtuse angle.

Solution

["B", "C", "D"]

Aligned Standards

4.G.A.2

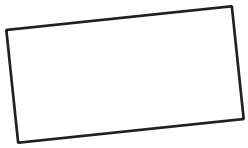
Problem 5

Students identify all lines of symmetry for different quadrilaterals including a rectangle, a parallelogram, and a rhombus. Both the rectangle and the rhombus have two lines of symmetry while the parallelogram has no lines of symmetry. Patty paper should be made available for this item so students can trace and try to fold the figures or flip them over.

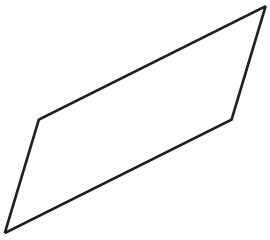
Statement

For each shape, draw **all** lines of symmetry.

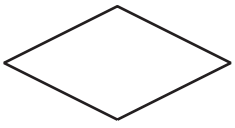
a.



b.



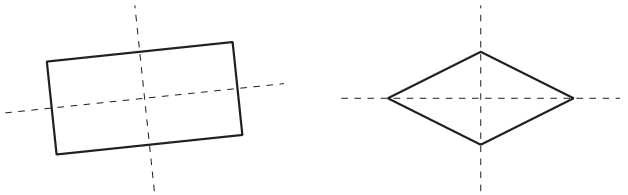
c.



Solution

a.

c. No lines of symmetry in the figure in part b.



Aligned Standards

4.G.A.3

Problem 6

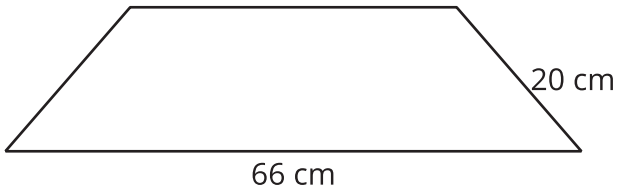
Students construct different quadrilaterals with a fixed perimeter. They may draw and label diagrams or supply reasoning with words and expressions as in the sample responses. For the last question, students need to find two missing side lengths. One can be found using the line of symmetry and the third can be found using the known information about the perimeter of the frame.

Statement

Elena, Tyler, and Mai each are making a frame for artwork so that:

- the frame is a quadrilateral
- the perimeter is 146 cm

1. Elena says she can make a square frame where each side has length 37 cm. Do you agree with Elena? Explain or show your reasoning.
2. Tyler says he is going to make a rectangular frame whose length is 29 cm. What will the width of Tyler's frame be? Explain or show your reasoning.
3. Mai decided to make this frame that has a line of symmetry.



What are the other two side lengths of Mai's frame? Explain or show your reasoning.

Solution

1. No. Sample response: A square has 4 sides of the same length, so the perimeter of Elena's square would be 4×37 cm and that's 148, which is too much.
2. 44 cm. Sample response: Tyler's frame will have another side that is 29 cm long so that's 2×29 or 58 cm total. The other two sides also have the same length and together they have length $146 - 58$ or 88 cm. So the other two side lengths are 44 cm.
3. The left side is 20 cm and the top side is 40 cm. Sample response: The line of symmetry is a vertical line down the middle of the frame so the left and right sides are the same length. Adding up the 3 side lengths gives 106 cm, so the remaining side length is $146 - 106$ or 40.

Aligned Standards

4.G.A.3, 4.MD.A.3