

NAME: \_\_\_\_\_

*G.G.39: Investigate, justify, and apply theorems about special parallelograms (rectangles, rhombuses, squares) involving their angles, sides, and diagonals*

1. 010919a, P.I. G.G.39

Which statement is *false*?

- [A] All rectangles are squares.  
[B] All parallelograms are quadrilaterals.  
[C] All squares are rhombuses.  
[D] All rectangles are parallelograms.

2. 010025a, P.I. G.G.39

Al says, "If  $ABCD$  is a parallelogram, then  $ABCD$  is a rectangle." Sketch a quadrilateral  $ABCD$  that shows that Al's statement is not always true. Your sketch must show the length of each side and the measure of each angle for the quadrilateral you draw.

3. 010736a, P.I. G.G.39

The perimeter of a square is 56. Express the length of a diagonal of the square in simplest radical form.

4. 080735a, P.I. G.G.39

In rhombus  $ABCD$ , the measure, in inches, of  $\overline{AB}$  is  $3x + 2$  and  $\overline{BC}$  is  $x + 12$ . Find the number of inches in the length of  $\overline{DC}$ .

5. 010533a, P.I. G.G.39

In rectangle  $ABCD$ ,  $AC = 3x + 15$  and  $BD = 4x - 5$ . Find the length of  $\overline{AC}$ .

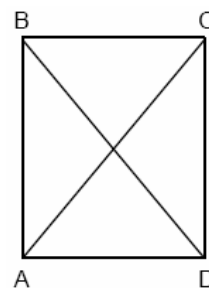
6. 010615a, P.I. G.G.39

A builder is building a rectangular deck with dimensions of 16 feet by 30 feet. To ensure that the sides form  $90^\circ$  angles, what should each diagonal measure?

- [A] 34 ft [B] 30 ft [C] 46 ft [D] 16 ft

7. 089909a, P.I. G.G.39

In the accompanying diagram of rectangle  $ABCD$ ,  $m\angle BAC = 3x + 4$  and  $m\angle ACD = x + 28$ .

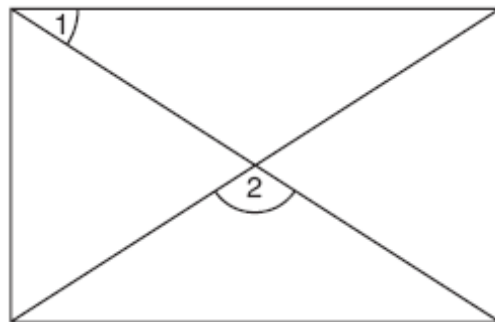


What is  $m\angle CAD$ ?

- [A] 50 [B] 12 [C] 40 [D] 37

8. 010835a, P.I. G.G.39

As shown in the accompanying diagram, a rectangular gate has two diagonal supports. If  $m\angle 1 = 42$ , what is  $m\angle 2$ ?



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[1] A

[2] The student draws a parallelogram, which is not a rectangle, with four sides and four angles labeled, such as angles of 60, 120, 60, and 120 and sides of 4, 6, 4, and 6.

[1] A parallelogram or rhombus, not a square, is drawn, which does not have measures for all lengths or angles.

[0] Angles and/or lengths are not appropriate for a parallelogram.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[2] obviously incorrect procedure.

[3]  $14\sqrt{2}$ , and appropriate work is shown, such as using the Pythagorean theorem or drawing a correctly labeled diagram that shows the isosceles right triangle.

[2] Appropriate work is shown, but one computational error is made.

or [2] Appropriate work is shown, but the answer is expressed as a decimal or the radical is not simplified.

[1] Appropriate work is shown, but two or more computational errors are made.

or [1] Appropriate work is shown, but one computational error is made, and the answer is not expressed as a radical in simplest form.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 14, the side of the square is found correctly, but no further correct work is shown.

or [1]  $14\sqrt{2}$ , but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[3] incorrect procedure.

[2] 17, and appropriate work is shown, such as solving the equation  $x + 12 = 3x + 2$ .

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] A correct equation is written and solved for  $x$ , but no further correct work is shown.

or [1] 17, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[4] incorrect procedure.

[2] 75, and appropriate work is shown, such as  $3x + 15 = 4x - 5$ .

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made, such as showing

$\overline{AC}$  and  $\overline{BD}$  as congruent opposite sides.

or [1] A correct equation is written, but no further correct work is shown.

or [1] A correct equation is written and solved for  $x$ , but the length of  $\overline{AC}$  is not found.

or [1] An incorrect equation of equal difficulty, such as  $3x + 15 + 4x - 5 = 180$ , is solved appropriately, and an appropriate

length of  $\overline{AC}$  is found.

or [1] 75, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[5] incorrect procedure.

[6] A

[7] A

[2] 96, and appropriate work is shown, such as an algebraic solution or a correctly labeled diagram.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 96, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[8] incorrect procedure.