8th grade Task 2 Squares and Rectangles

Student Task	Use the properties of shapes to find similar shapes.
Core Idea 4 Geometry and Measurement	**Analyze characteristics and properties of two- and three-dimensional geometric shapes; develop mathematical arguments about geometric relationships; apply transformations and use symmetry to analyze mathematical situations; and apply appropriate techniques tools, and formulas to determine measurements.** • Understand relationships among the angles, side lengths, perimeter, and area of similar objects • Describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling.
Core Idea 2 Mathematical Reasoning	**Employ forms of mathematical reasoning and justification appropriately to the solution of a problem.** • Formulate conjectures and test them for validity

Eighth Grade – 2003

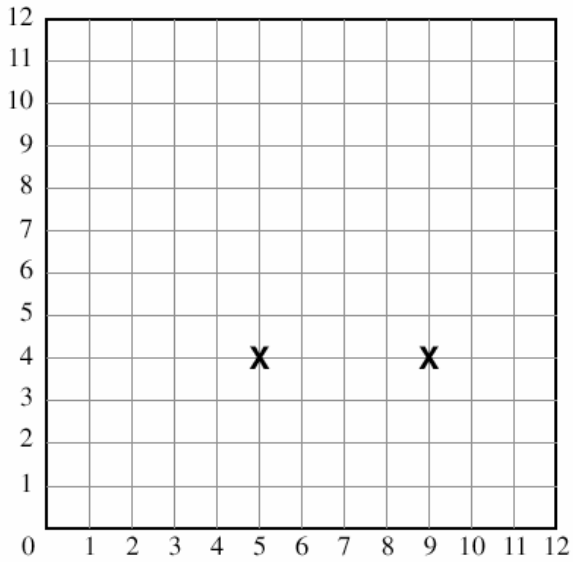
Squares and Rectangles

This problem gives you the chance to:
- use properties of shapes
- use coordinates

1. What specific properties must a quadrilateral have in order to be a rectangle?

2. What specific property must a rectangle have in order to be a square?

On this grid, the Xs indicate two corners of a square.



There are three different ways to draw a square with these Xs as two of its corners.

3. Draw the three squares on the grid.

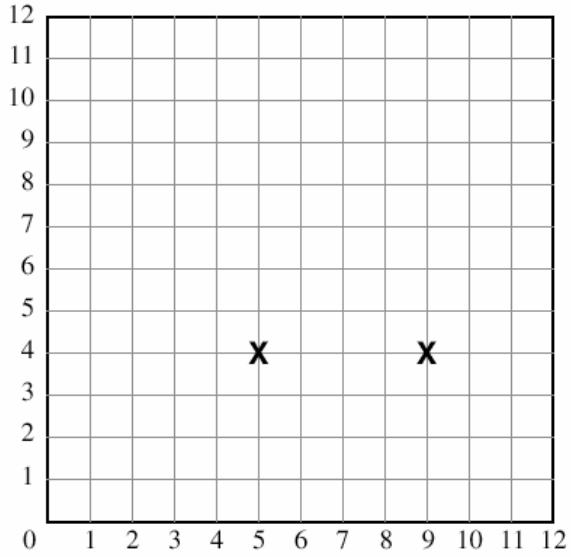
4. Write the coordinates of the corners of the three squares.

Square 1 (,) (,) (,) (,)

Square 2 (,) (,) (,) (,)

Square 3 (,) (,) (,) (,)

The points marked by Xs on this grid indicate two corners of a rectangle.
Suppose that the area of each square on the grid is 1 cm^2.



5. On the grid above, draw a rectangle with two of its corners on the Xs. Your rectangle should have a width to height ratio of 2 : 3.

6. What is the area of your rectangle? _____

7. How many different rectangles can be drawn on the grid using the points marked by Xs as corners?

Explain your reasoning.

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Squares and Rectangles	**Test 8 Form A Rubric**	
The core elements of performance required by this task are: • use properties of shapes • use coordinates Based on these, credit for specific aspects of performance should be assigned as follows:	**Points**	**Section Points**
1. Gives correct answers as: The corners must be right angles.	2	2
2. Gives correct answer as: The sides must be all the same length.	1	1
3. Draws three correct squares on the grid with corners on the Xs. *Partial credit:* Draws two correct squares: 2 points Draws one correct square: 1 point	3 (2) (1)	3
4. Gives correct coordinates as: Square 1 (5, 4) (5, 8) (9, 8) (9, 4) Square 2 (5, 4) (9, 4) (9, 0) (5, 0) Square 3 (5, 4) (7, 6) (9, 4) (7, 2) *Partial credit:* Gives correct coordinates for two of the three squares: 2 points Gives correct coordinates for one of the three squares: 1 point	3 (2) (1)	3
5. Draws correct rectangle with corners at (5, 10) (9, 10).	1	1
6. Gives correct answer as: **24** cm^2	1	1
7. Gives explanation such as: 12 or 13 (thinking of how many can be drawn on this grid with other two corners on grid-points) **or** As many as you like because the height of the rectangle can be any size – the grid can go on forever and/or other two corners do not have to be on grid-points. **or** Correctly considers rectangles with ratios 2:3.	1 **or** 1 **or** 1	1
	Total Points	**12**