

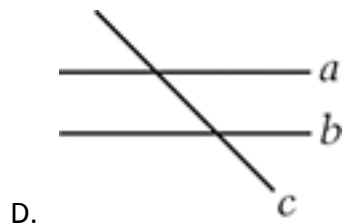
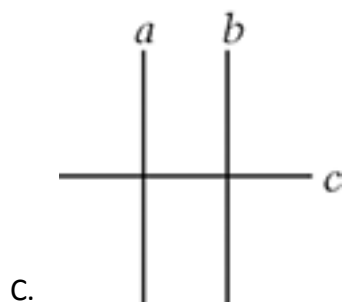
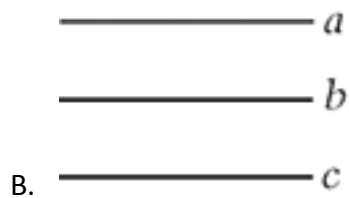
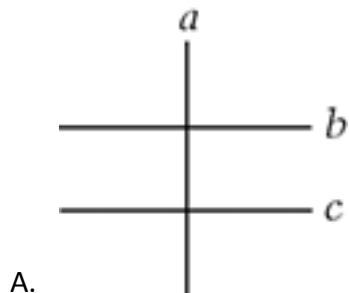
NAEP Released Items Aligned to the Iowa Core

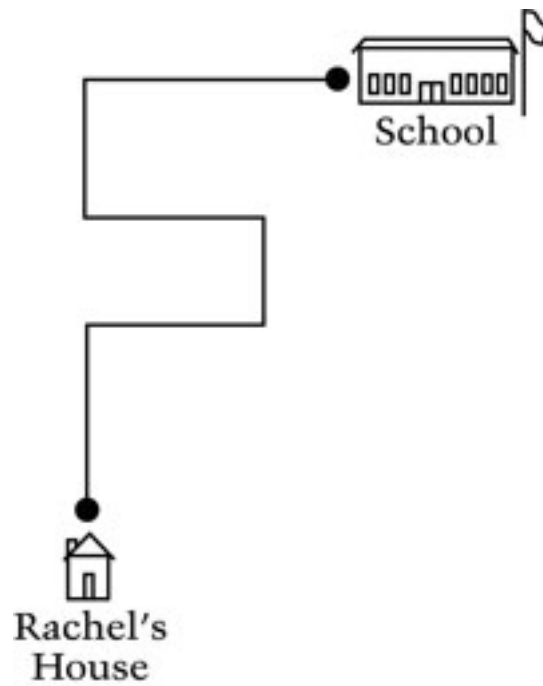
4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Lines a and b are parallel to each other.
Line c is perpendicular to these lines.

Jan correctly draws lines a , b , and c .

Which of these could be Jan's drawing?





The picture shows Rachel's path to school. How many right angle turns does Rachel make to get to school?

- A. Two
- B. Three
- C. Five
- D. Seven

2007-4-11-12

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

In the space below, draw an angle that is larger than 90° .

2003-4-6-21
2003-8-6-21

Source: National Assessment of Educational Progress, 2003, Grade 4 and Grade 8 Mathematics Assessments.

In the space below, draw a closed figure with 5 sides. Make 2 of the angles right angles.

2003-4-7-19

Source: National Assessment of Educational Progress, 2003, Grade 4 Mathematics Assessment.





In the space below, use your ruler to draw a square with two of its corners at the points shown.



1992-4-5-4
1992-8-5-4

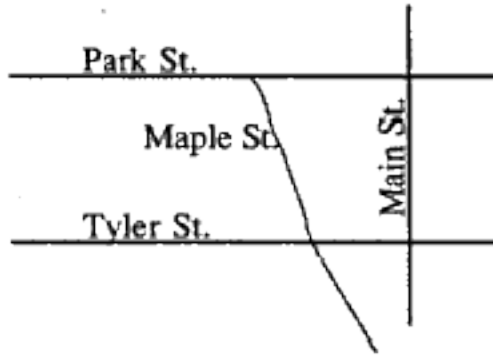
Source: National Assessment of Educational Progress, 1992, Grade 4 and Grade 8 Mathematics Assessments.

Which letter has two parallel lines?

- A. 
- B. 
- C. 
- D. 

1992-4-12-6

Source: National Assessment of Educational Progress, 1992, Grade 4 Mathematics Assessment.



According to the map in the figure above, which streets appear to be parallel to each other?

- A. Park and Main
- B. Tyler and Maple
- C. Park and Tyler
- D. Main and Tyler

1990-4-7-8

Source: National Assessment of Educational Progress, 1990, Grade 4 Mathematics Assessment.

Lines k , l , and m are three different lines. If line k is parallel to line l and line l is parallel to line m , which of the following statements must be true?

- A. Line k is perpendicular to line l .
- B. Line k is perpendicular to line m .
- C. Line k is parallel to line m .
- D. Line k intersects line l .
- E. Line k intersects line m .

2011-8-9-2

Source: National Assessment of Educational Progress, 2011, Grade 8 Mathematics Assessment.



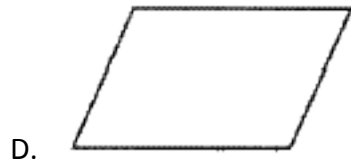
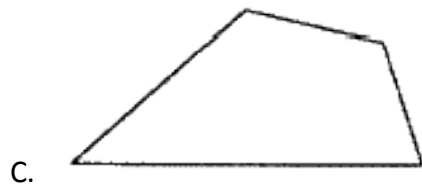
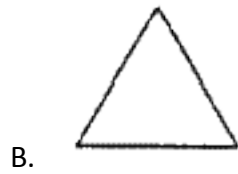
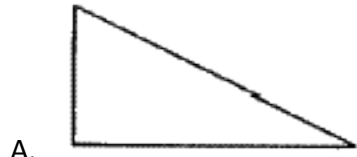
2. What is the intersection of rays PQ and QP in the figure above?

- A. Segment PQ
- B. Line PQ
- C. Point P
- D. Point Q
- E. The empty set

2007-8-11-8

Source: National Assessment of Educational Progress, 2007, Grade 8 Mathematics Assessment.

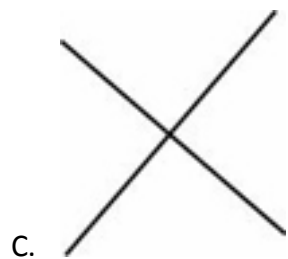
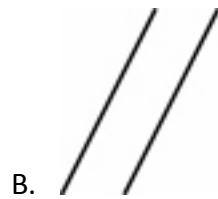
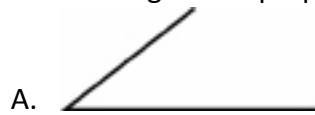
Which of the following figures contains line segments that are perpendicular?



1990-8-7-14
1990-12-7-14

Source: National Assessment of Educational Progress, 1990, Grade 8 and Grade 12 Mathematics Assessments

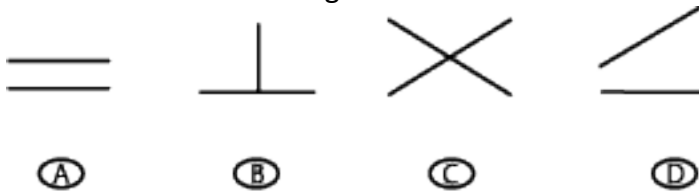
Which of the following shows perpendicular lines?



2008-13-21-17
2008-17-21-17

Source: National Assessment of Educational Progress, 2008, Age 13 and Age 17 Mathematics Assessments.

Fill in the oval below the drawing that shows PERPENDICULAR LINES.

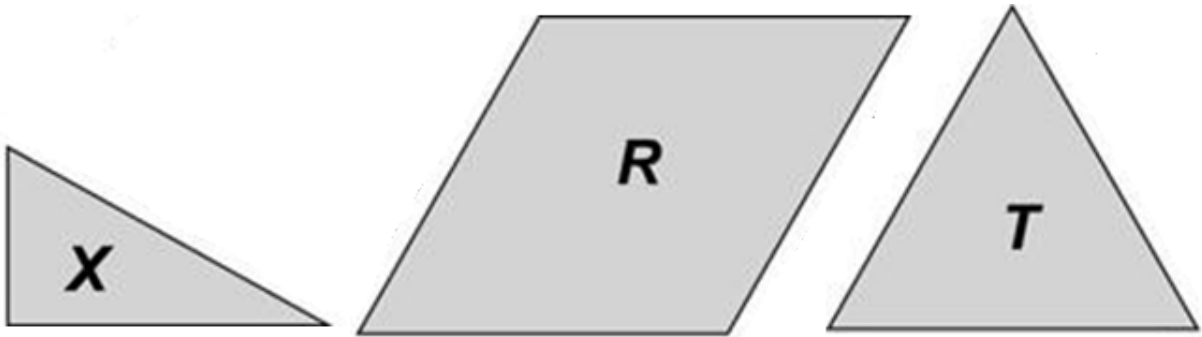


2008-13-23-32
2004-17-23-13

Source: National Assessment of Educational Progress, 2008, Age 13 and Age 17 Mathematics Assessment.

4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

Question 12 refers to additional material:



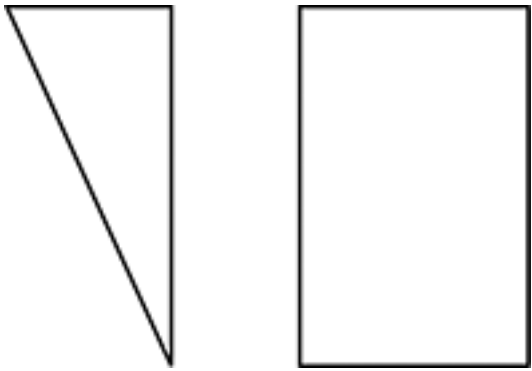
You will need one piece labeled *X*, one piece labeled *R*, and one piece labeled *T* to answer this question.

Which of the pieces has an angle greater than a right angle?

- A. Only *X*
- B. Only *R*
- C. Only *T*
- D. Both *R* and *T*

2009-4-5-5

Source: National Assessment of Educational Progress, 2009, Grade 4 Mathematics Assessment.

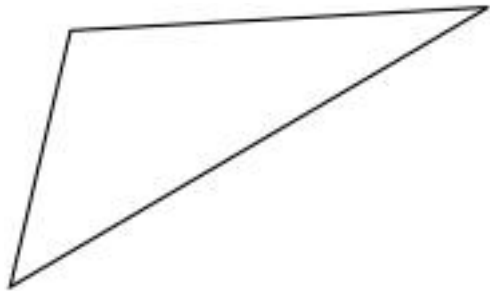


How are the right triangle and the rectangle alike?

- A. Each figure has at least one right angle.
- B. Each figure has parallel sides.
- C. Each figure has at least one line of symmetry.
- D. Each figure has at least two sides that are the same length.

2011-4-9-13

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

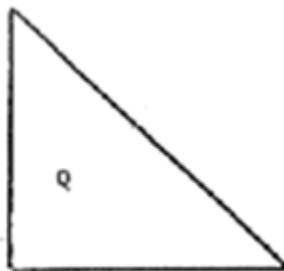
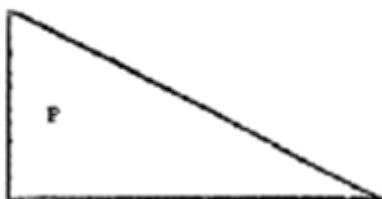
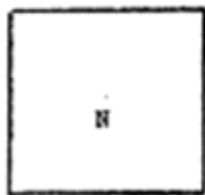


How many of the angles in this triangle are smaller than a right angle?

- A. None
- B. One
- C. Two
- D. Three

2005-4-4-4
2005-8-4-4

Source: National Assessment of Educational Progress, 2005, Grade 4 and Grade 8 Mathematics Assessments.



Laura was asked to choose 1 of the 3 shapes *N*, *P*, and *Q* that is different from the other 2. Laura chose shape *N*. Explain how shape *N* is different from shapes *P* and *Q*. You may use drawings to help explain your answers.

1996-4-10-1
1996-8-10-1
1996-12-10-1

Source: National Assessment of Educational Progress, 1996, Grade 4, Grade 8 and Grade 12 Mathematics Assessments.

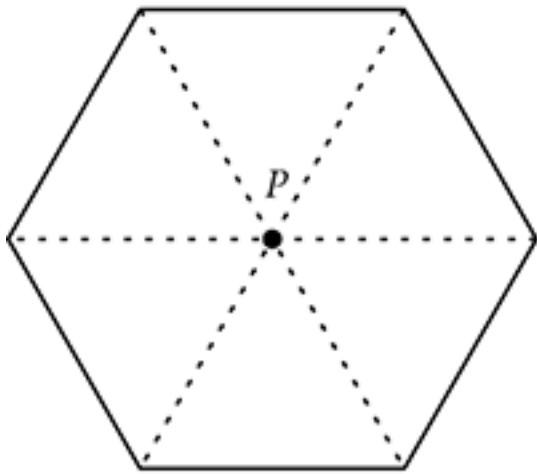


Figure 1

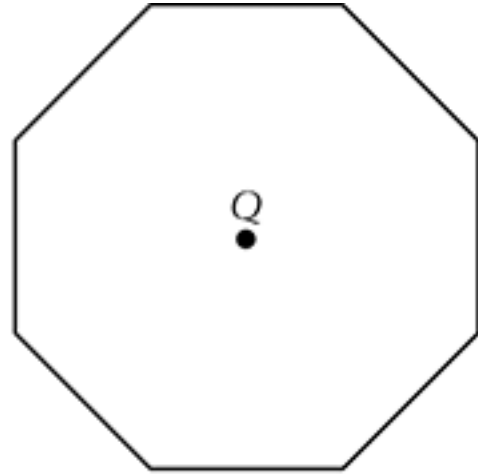


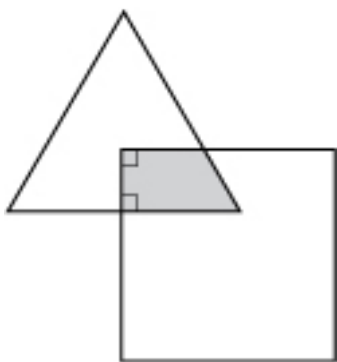
Figure 2

Figure 1 is a regular hexagon with its center at point P. The dotted lines divide the hexagon completely into 6 congruent triangles sharing a vertex at point P.

Figure 2 is a regular octagon with its center at point Q. The octagon can be completely divided into congruent triangles sharing a vertex at point Q.

This division could produce

- A. sixteen congruent equilateral triangles.
- B. sixteen congruent isosceles triangles.
- C. eight congruent right triangles.
- D. eight congruent equilateral triangles.
- E. eight congruent isosceles triangles.



In the figure above, the intersection of the triangle and the square forms the shaded region. What is the shape of this region?

- A. An equilateral triangle
- B. A rectangle
- C. A square
- D. A rhombus
- E. A trapezoid

2007-8-7-6

Source: National Assessment of Educational Progress, 2007, Grade 8 Mathematics Assessment.

A certain 4-sided figure has the following properties.

- Only one pair of opposite sides are parallel.
- Only one pair of opposite sides are equal in length.
- The parallel sides are not equal in length.

Which of the following must be true about the sides that are equal in length?

- A. They are perpendicular to each other.
- B. They are each perpendicular to an adjacent side.
- C. They are equal in length to one of the other two sides.
- D. They are not equal in length to either of the other two sides.
- E. They are not parallel.

2005-8-6-14

Source: National Assessment of Educational Progress, 2005, Grade 8 Mathematics Assessment.

A triangle has a 120° angle. Indicate if the following **MUST** be true, **MAY** be true or **CANNOT** be true about the triangle.

	Must be true	May be true	Cannot be true
The triangle is a right triangle.	<input type="radio"/> (A)	<input type="radio"/> (B)	<input type="radio"/> (C)

2004-17-23-25

Source: National Assessment of Educational Progress, 2004, Age 17 Mathematics Assessment.

A triangle has a 120° angle. Indicate if the following **MUST** be true, **MAY** be true or **CANNOT** be true about the triangle.

	Must be true	May be true	Cannot be true
The triangle is an isosceles triangle.	<input type="radio"/> (A)	<input type="radio"/> (B)	<input type="radio"/> (C)

2004-17-23-26

Source: National Assessment of Educational Progress, 2004, Age 17 Mathematics Assessment.

A triangle has a 120° angle. Indicate if the following **MUST** be true, **MAY** be true or **CANNOT** be true about the triangle.

	Must be true	May be true	Cannot be true
The triangle is equilateral.	<input type="radio"/> (A)	<input type="radio"/> (B)	<input type="radio"/> (C)

2004-17-23-27

Source: National Assessment of Educational Progress, 2004, Age 17 Mathematics Assessment.

A triangle has a 120° angle. Indicate if the following **MUST** be true, **MAY** be true or **CANNOT** be true about the triangle.

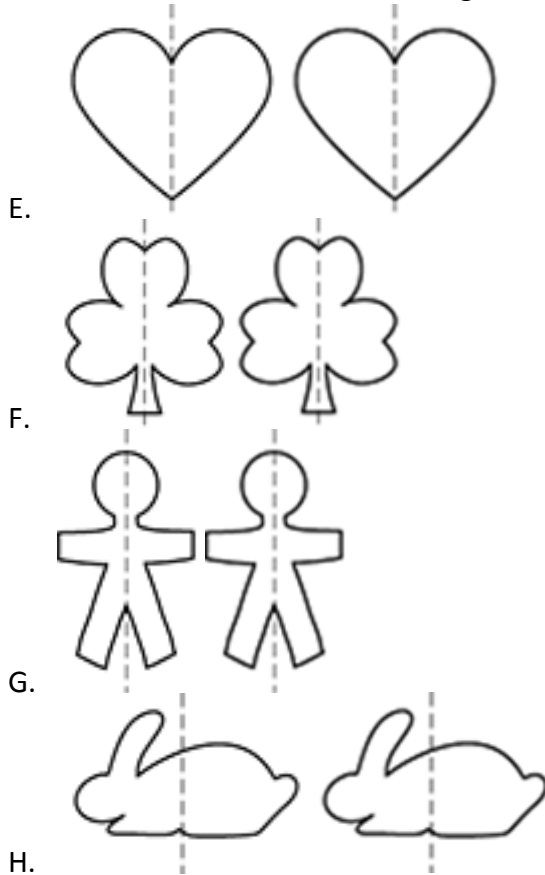
	Must be true	May be true	Cannot be true
The sum of the other two angles is 60° .	<input type="radio"/> (A)	<input type="radio"/> (B)	<input type="radio"/> (C)

2004-17-23-28

Source: National Assessment of Educational Progress, 2004, Age 17 Mathematics Assessment.

4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Which decoration CANNOT be folded along the dotted line so that both parts match?



This question refers to additional materials:

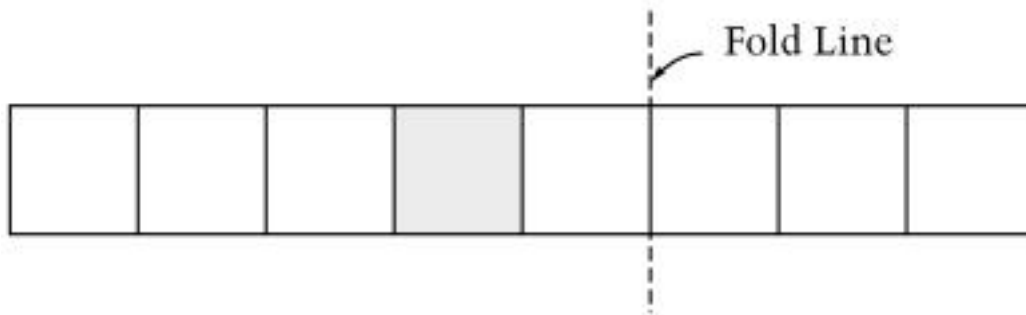


The following question refers to the number tiles or the paper strip.

You may use the paper strip.

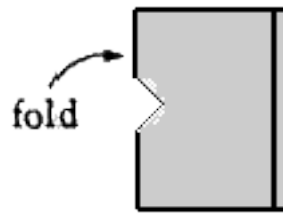
Place an X in one of the squares below so that if the paper strip were folded along the dotted fold line shown, the square with the X could cover the shaded square.

Show your answer on the strip below.



2005-4-4-13
2005-8-4-12

Source: National Assessment of Educational Progress, 2005, Grade 4 and Grade 8 Mathematics Assessments.



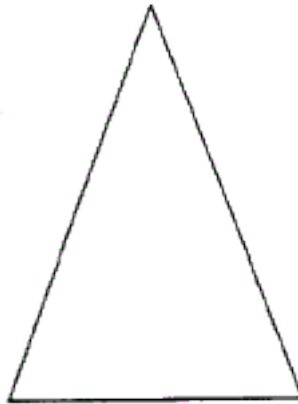
A sheet of paper is folded once and a piece is cut out as shown above. Which of the following looks like the unfolded paper?

- A.
- B.
- C.
- D.

1992-4-7-4
1992-8-7-4

Source: National Assessment of Educational Progress, 1992, Grade 4 and Grade 8 Mathematics Assessments.

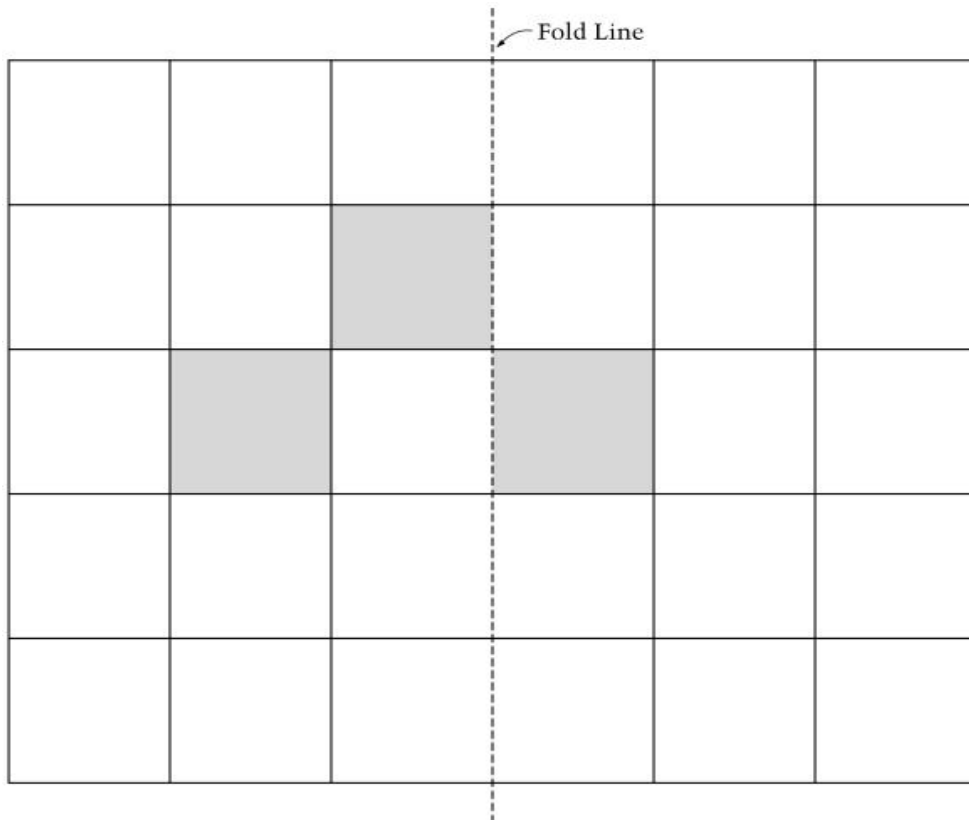
Draw a line of symmetry on the triangle below.



1990-4-9-15

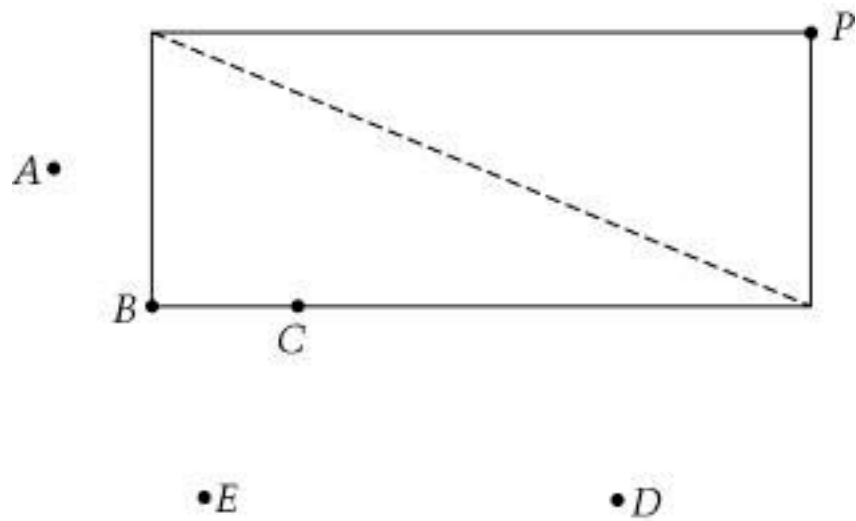
Source: National Assessment of Educational Progress, 1990, Grade 4 Mathematics Assessment.

Shade five more squares on the grid below so that if your completed figure were folded along the fold line both sides would match.



2005-8-4-13

Source: National Assessment of Educational Progress, 2005, Grade 8 Mathematics Assessment.



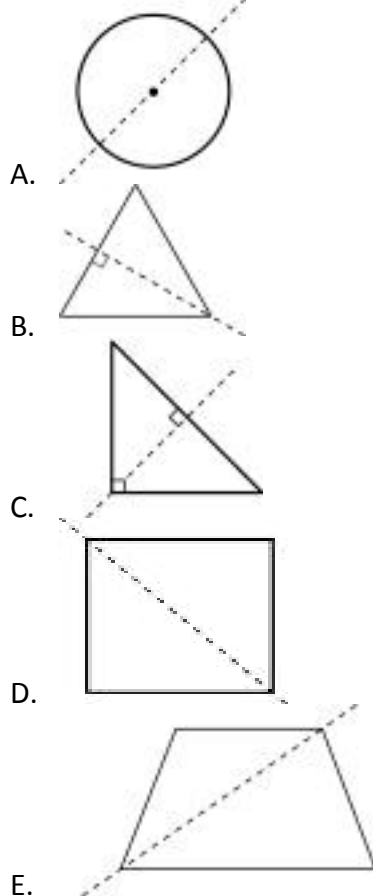
When the rectangle above is folded along the dotted line, point P will touch which of the lettered points?

- A. A
- B. B
- C. C
- D. D
- E. E

2003-8-7-7

Source: National Assessment of Educational Progress, 2003, Grade 8 Mathematics Assessment.

In which of the following figures is the dashed line NOT a line of symmetry?



2005-12-4-8

Source: National Assessment of Educational Progress, 2005, Grade 12 Mathematics Assessment.
