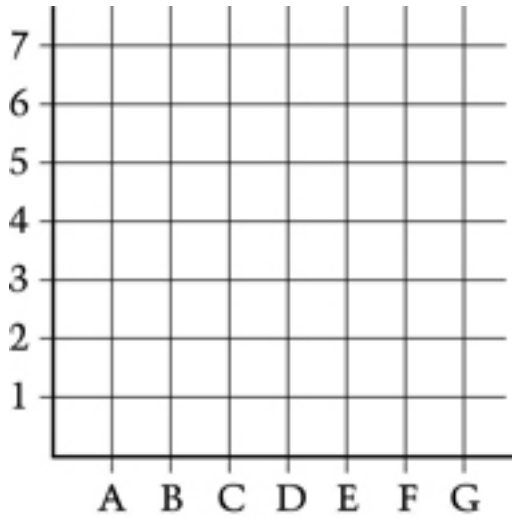
NAEP Released Items Aligned to the Iowa Core

5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

On the grid below, plot the points that have coordinates (B, 1), (B, 3), and (D, 5).



Plot 3 more points on the grid so that when you connect all 6 points you will make a rectangle.

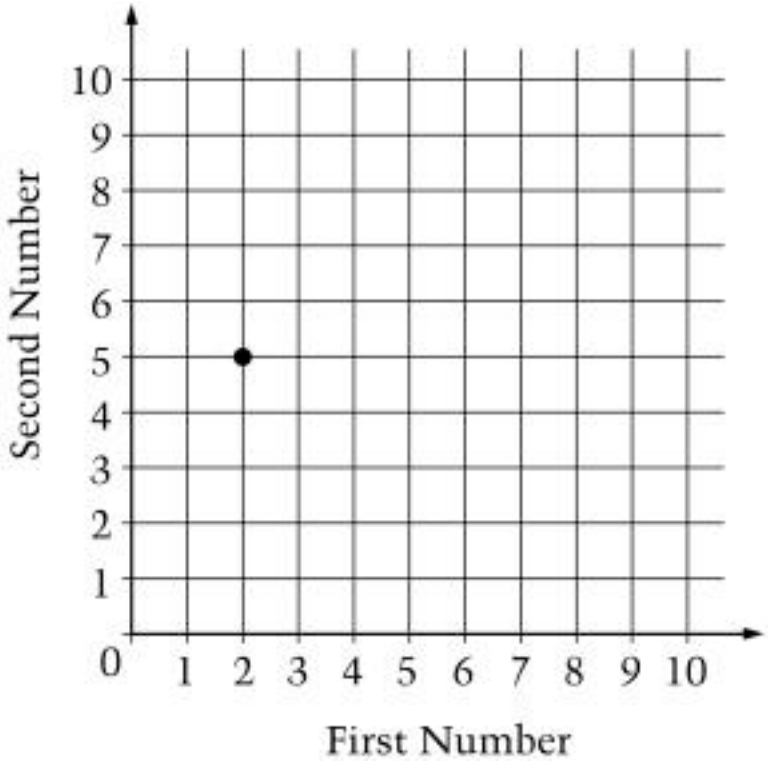
List the coordinates for the 3 new points. _____ _____ _____

Connect the 6 points to show your rectangle.

2009-4-10-16

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

A point is shown on the grid below. The coordinates of the point are (2,5).

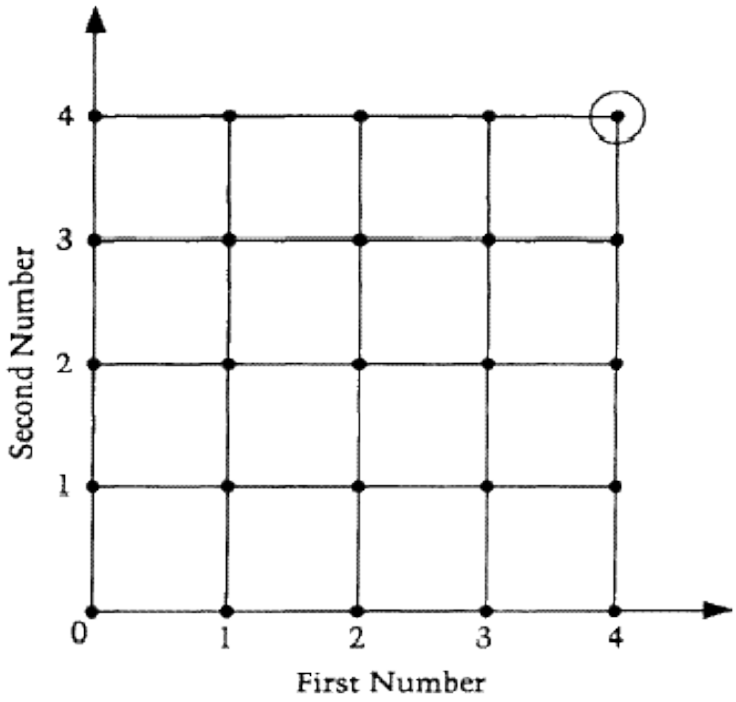


On the same grid draw the point with coordinates (4, 7) and the point with coordinates (8, 0).

2003-4-10-10

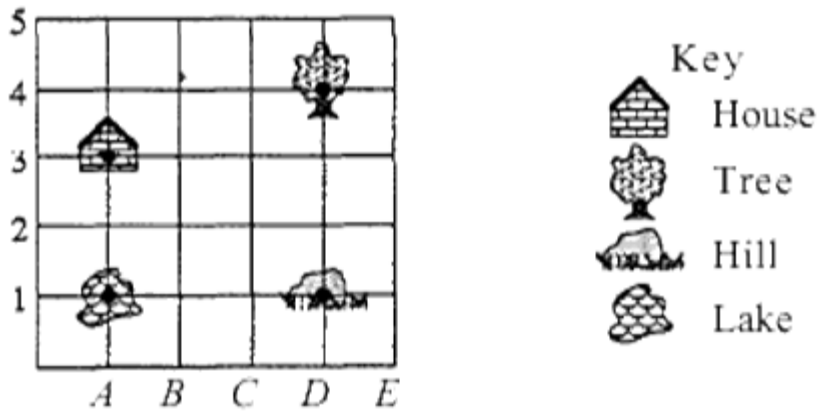
Source: National Assessment of Educational Progress, 2003, Grade 4 Mathematics Assessment.

On the grid below, the dot at (4, 4) is circled. Circle two other dots where the first number is equal to the second number.



1992-4-15-8
1992-8-15-8

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

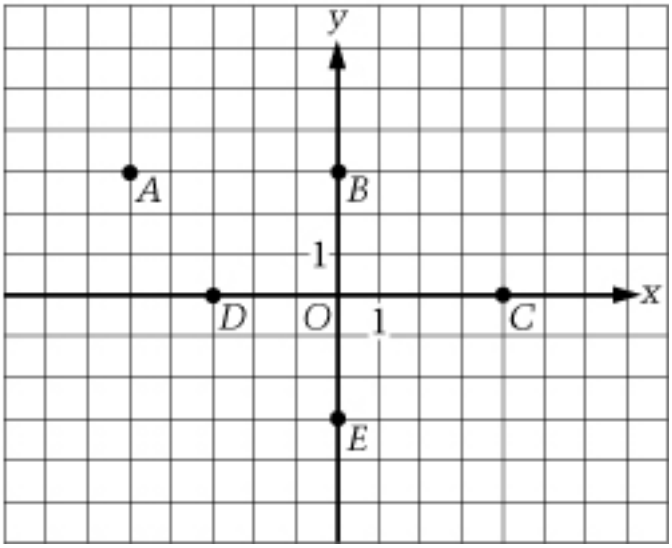


On the map above, which ordered pair gives the location of the house?

A. (D,1)
B. (D,4)
C. (A,1)
D. (A,3)

1990-4-7-1

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



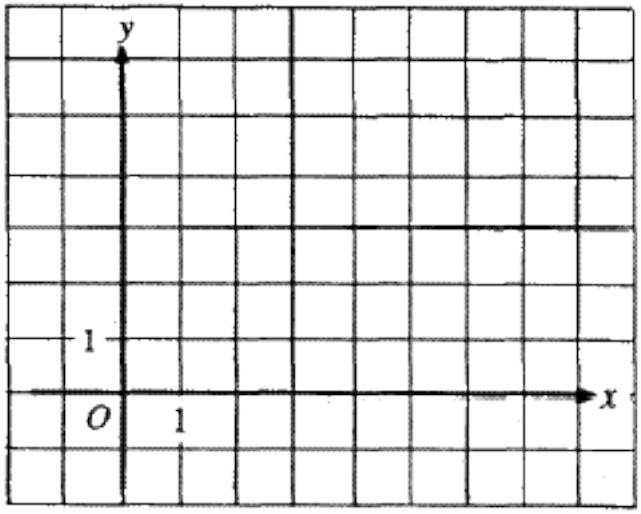
The graph above shows lettered points in an (*x*, *y*) coordinate system. Which lettered point has coordinates (-3, 0)?

A. *A*
B. *B*
C. *C*
D. *D*
E. *E*

2007-8-11-2

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

Plot the point (5, 2) on the grid shown below.

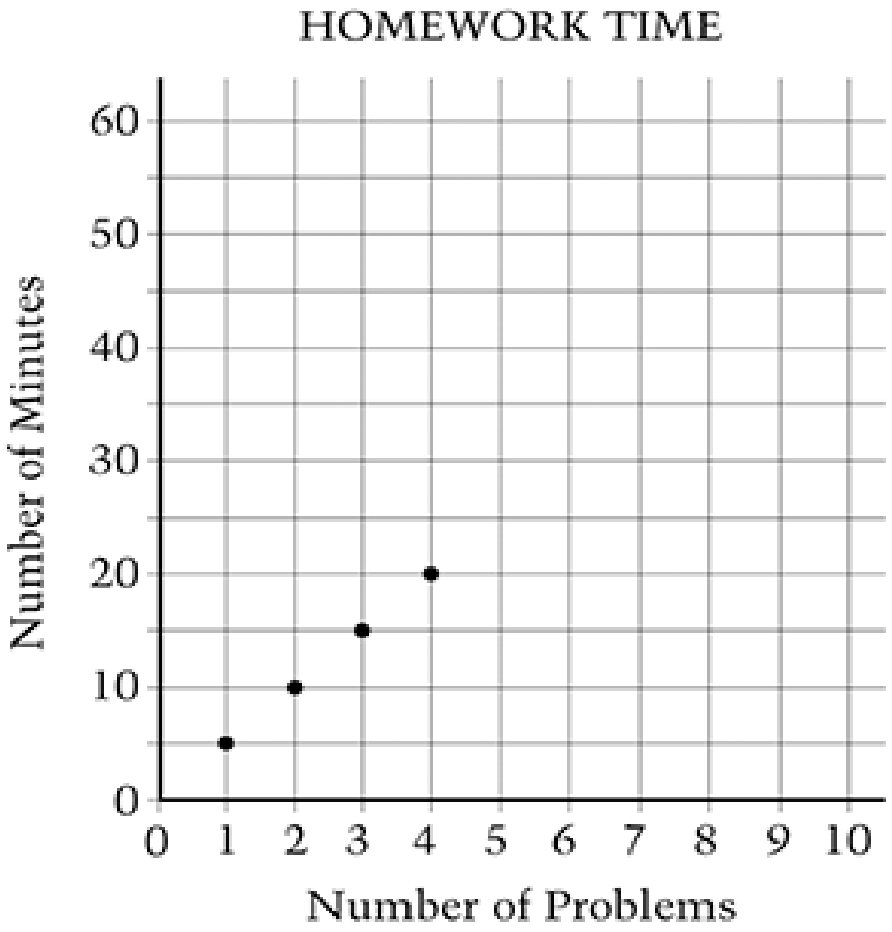


1990-8-9-15

Source: National Assessment of Educational Progress, 1990, Grade 8 Mathematics Assessment.

5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

The graph shows the total number of minutes it took Selena to do math problems.



How many minutes did it take her to do 3 problems?

Answer: _____ minutes

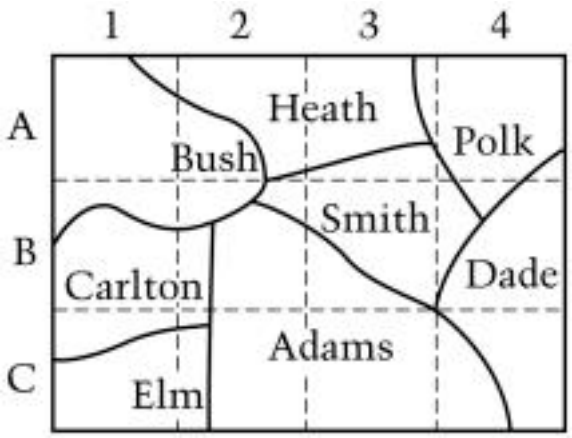
Selena continues to work at the same rate.

How many problems will she do in 40 minutes?

Answer: _____ problems

2011-4-9-9

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



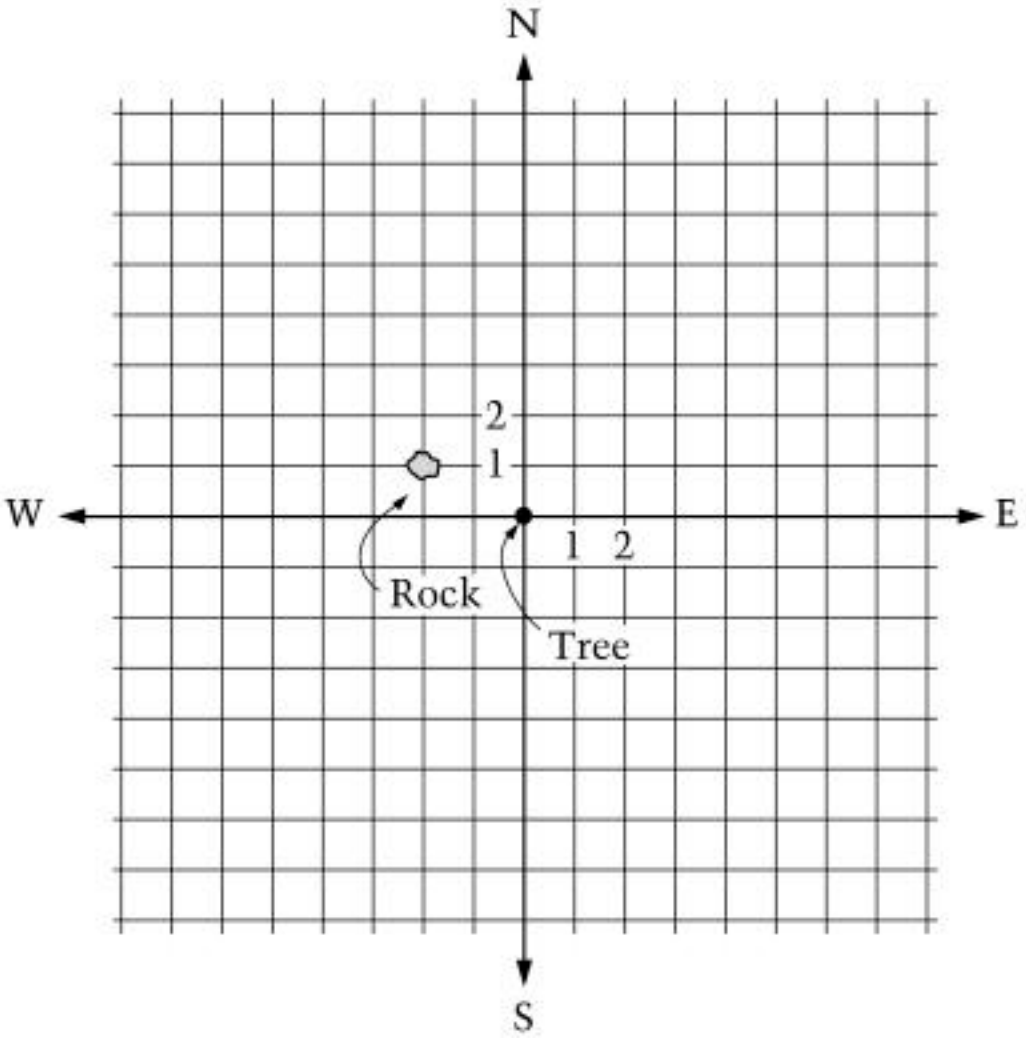
The map above shows eight of the counties in a state. The largest city in the state can be found at location B-3. In which county could this city lie?

A. Adams or Carlton
B. Adams or Smith
C. Carlton or Elm
D. Dade or Polk
E. Polk or Smith

2005-8-12-14

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

On the map below, the rock is located 2 miles west and 1 mile north of the tree. A treasure chest (not shown) is located 8 miles east and 4 miles north of the rock. Mark the location of the treasure chest on the map with an X.



What is the position of the treasure chest with respect to the tree?

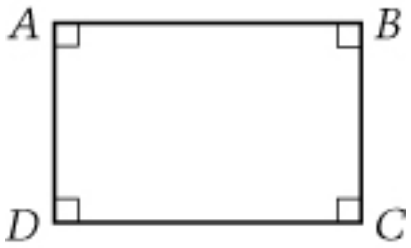
Answer: _____ miles east and _____ miles north of the tree

2003-8-10-15

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

5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

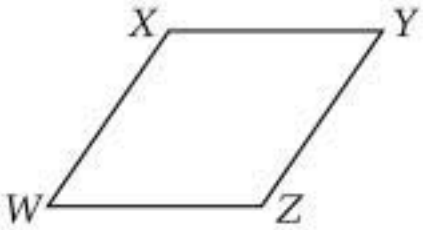
Sara was asked to draw a parallelogram. She drew the figure below.



Is Sara's figure a parallelogram? Why or why not?

2007-8-11-13

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



In the figure above, *WXYZ* is a parallelogram. Which of the following is NOT necessarily true?

A. Side *WX* is parallel to side *ZY*.
B. Side *XY* is parallel to side *WZ*.
C. The measures of angles *W* and *Y* are equal.
D. The lengths of sides *WX* and *ZY* are equal.
E. The lengths of sides *WX* and *XY* are equal.

2003-8-7-10

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

The degree measures of the angles of a rectangle are a, b, c, and d. Which of the following must be true about the rectangle?

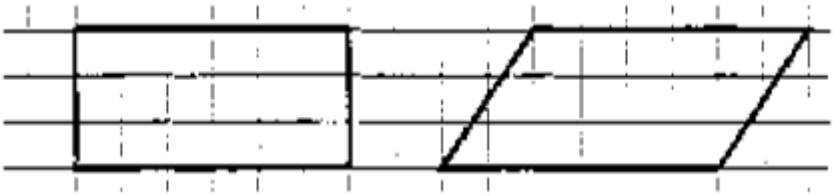
A. $a + b + c = d$
B. $a + b + c + d = 90$
C. $a + b + c + d = 180$
D. $a + b + c + d = 270$
E. $a + b + c + d = 360$

2008-17-21-20

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

5.G.4 Classify two-dimensional figures in a hierarchy based on properties.

Think carefully about the following question. Write a complete answer. You may use drawings, words, and numbers to explain your answer. Be sure to show all of your work.



In what ways are the figures above alike? List as many ways as you can.

In what ways are the figures above different? List as many ways as you can.

1996-4-9-10

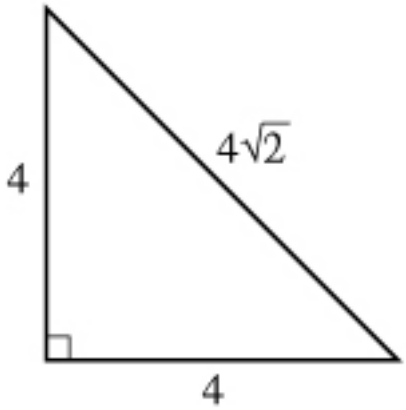
Source: National Assessment of Educational Progress, 1996, Grade 4 Mathematics Assessment.

Nick has a square piece of paper. He draws the two diagonals of the square, finds the point where they intersect, and labels that point A. Then he folds each of the four corners of the paper onto point A. What geometric shape is produced?

A. A square
B. A right triangle
C. An isosceles triangle
D. A pentagon
E. A hexagon

2007-8-9-17

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



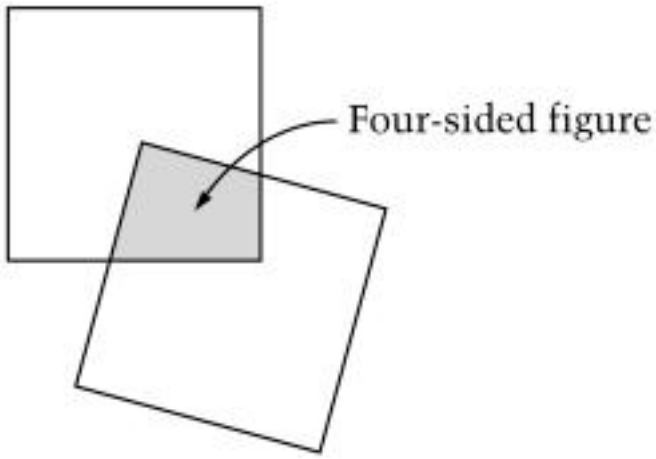
What kind of triangle is shown above?

A. Equilateral
B. Isosceles
C. Scalene
D. Acute
E. Obtuse

2007-8-11-4

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

When two tiles are partially overlapped, different geometric figures are formed by the overlapping parts. One example is shown below. Which of the following figures cannot be formed by the overlapping parts of the two tiles?



A. Triangle
B. Rectangle
C. Square
D. Five-sided figure
E. Nine-sided figure

2005-8-4-15

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

A triangle that has sides with lengths 6, 6, and 10 is called

A. acute
B. right
C. scalene
D. isosceles
E. equilateral

2003-8-6-23

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

If a triangle is equilateral, which of the following must be true?

A. Only two sides are equal.
B. All sides are equal.
C. All angles are right angles.
D. All angles have different degree measures.

2008-17-21-9

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