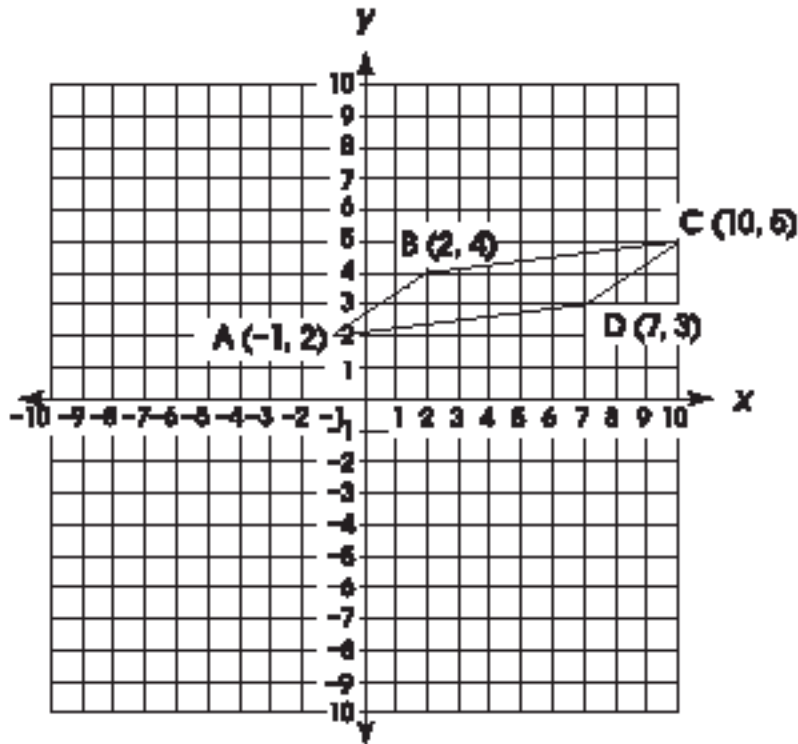


Question 5
Benchmark A
Spring 2003

Four points are connected with line segments, as shown on the coordinate plane below.

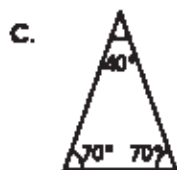
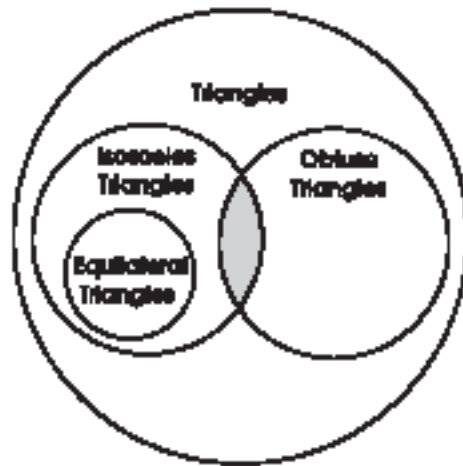


In your **Answer Document**, find the slope of each side.

Determine if the shape is a parallelogram. Show your work or provide an explanation to support your answer.

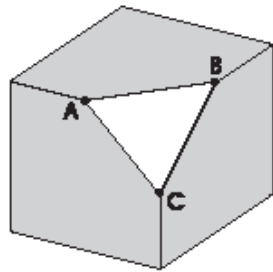
Question 21
Benchmark A
Spring 2003

21. The Venn diagram below represents relationships among various kinds of triangles.



Question 13
Benchmark A
Spring 2004

Daniel cut the corner off a cube as shown in the diagram below.



Points A, B and C are the midpoints of the edges of the cube. What type of three-dimensional figure has been cut off?

- A. cone
- B. cube
- C. triangular prism
- D. triangular pyramid

Question 3
Benchmark A
Spring 2005

Joseph plans to tile his kitchen floor. All the tiles will be identical regular polygons. Joseph wants three tiles to meet at each vertex with no space left over.

What shape of tile should he use?

- A. pentagon
- B. hexagon
- C. triangle
- D. square

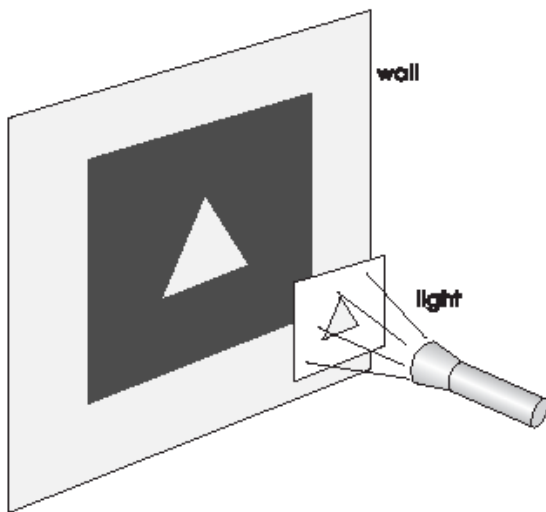
Question 32
Benchmark B
Spring 2003

32. The angle of the roof on Kaya's dollhouse is 56° . She built a scale model of the dollhouse with a scale ratio of 1 : 4. What is the measure of the angle of the roof of the model?

- A. 14°
- B. 34°
- C. 56°
- D. 224°

Question 36
Benchmark B
Spring 2004

36. A student shines a light through a cutout of a triangle held parallel to a wall several feet straight in front of him, producing a similar image on the wall.



What must the two triangles have in common?

- A. equal areas
- B. equal heights
- C. corresponding sides that are congruent
- D. corresponding angles that are congruent

Question 23
Benchmark B
Spring 2005

The shadow cast by a one-foot ruler is 8 inches long. At the same time, the shadow cast by a pine tree is 24 feet long.

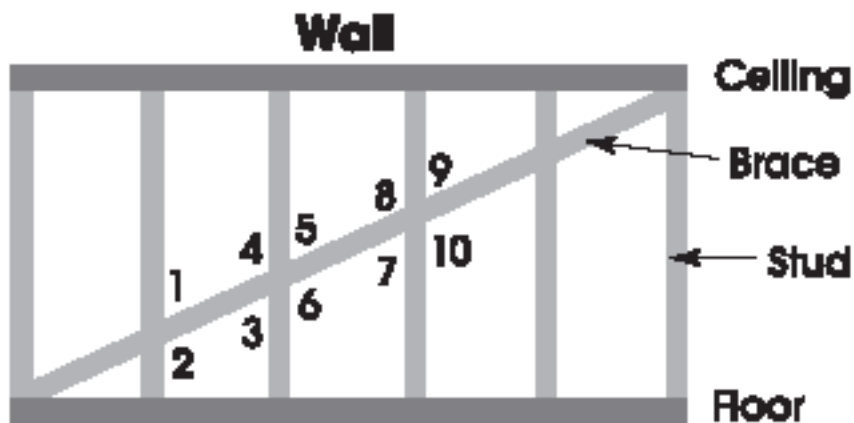


What is the height, in feet, of the pine tree?

- A. 3 feet
- B. 16 feet
- C. 36 feet
- D. 192 feet

Question 1
Benchmark C
Spring 2003

When framing in a wall, carpenters make sure that all vertical studs are perpendicular to the floor and ceiling. They sometimes add a diagonal brace for added support during construction (as shown in the drawing).

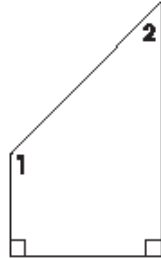


When the vertical studs are perpendicular to the floor, which pair of angles will always be congruent?

- A. $\angle 1$ and $\angle 2$
- B. $\angle 3$ and $\angle 6$
- C. $\angle 5$ and $\angle 7$
- D. $\angle 6$ and $\angle 9$

Question 1
Benchmark C
Spring 2005

1. Ms. Chen drew a diagram for a new patio in her backyard.



The measure of $\angle 1$ is 3 times as large as the measure of $\angle 2$.

What is the measure of $\angle 2$?

- A. 45°
- B. 67.5°
- C. 120°
- D. 135°

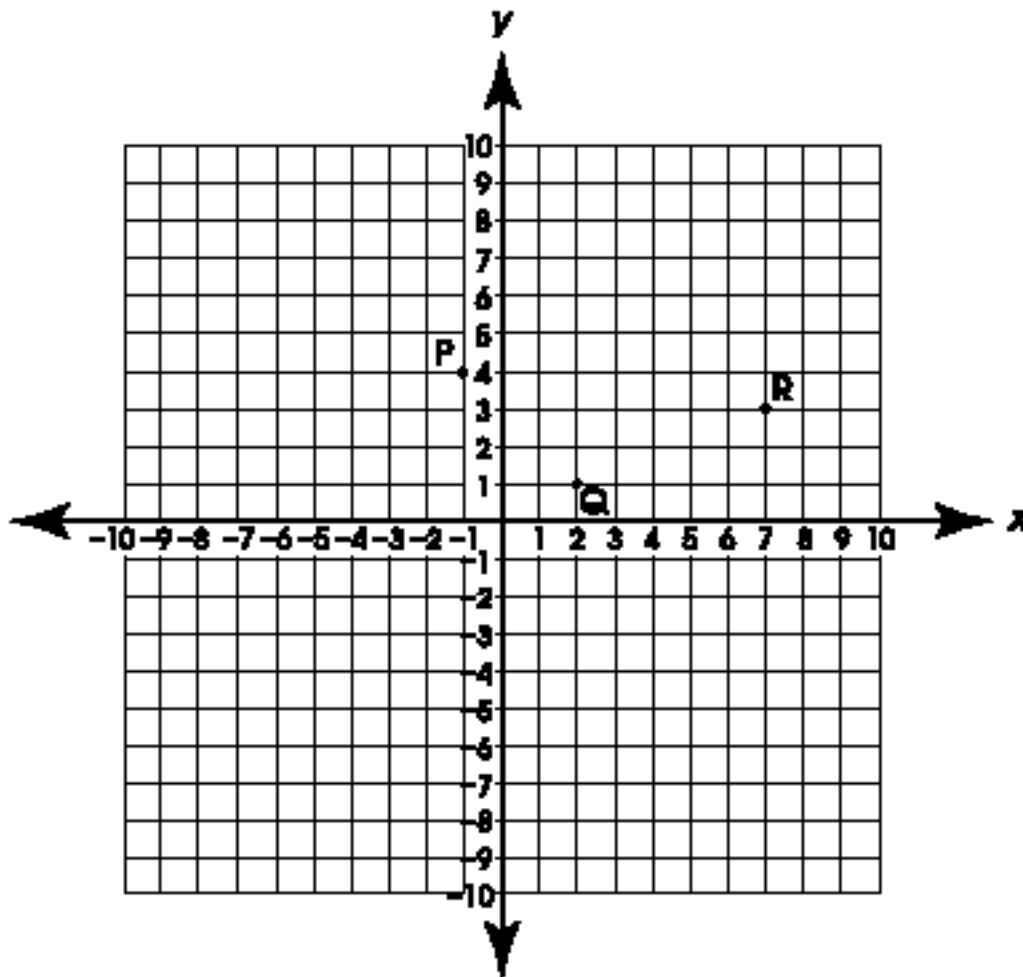
Question 38
Benchmark D
Spring 2003

A circle is sketched on a coordinate plane with the center at $(6, 8)$. The circle passes through the point $(0, 5)$. Which of these expressions could be used to find r , the radius of the circle?

- A. $\sqrt{(6-0)^2 + (8-5)^2}$
- B. $\sqrt{(6+8)^2 + (0+5)^2}$
- C. $\sqrt{(6-8)^2 + (0-5)^2}$
- D. $\sqrt{(6+0)^2 + (8+5)^2}$

Question 30
Benchmark D
Spring 2004

30. Points P, Q and R are shown below.

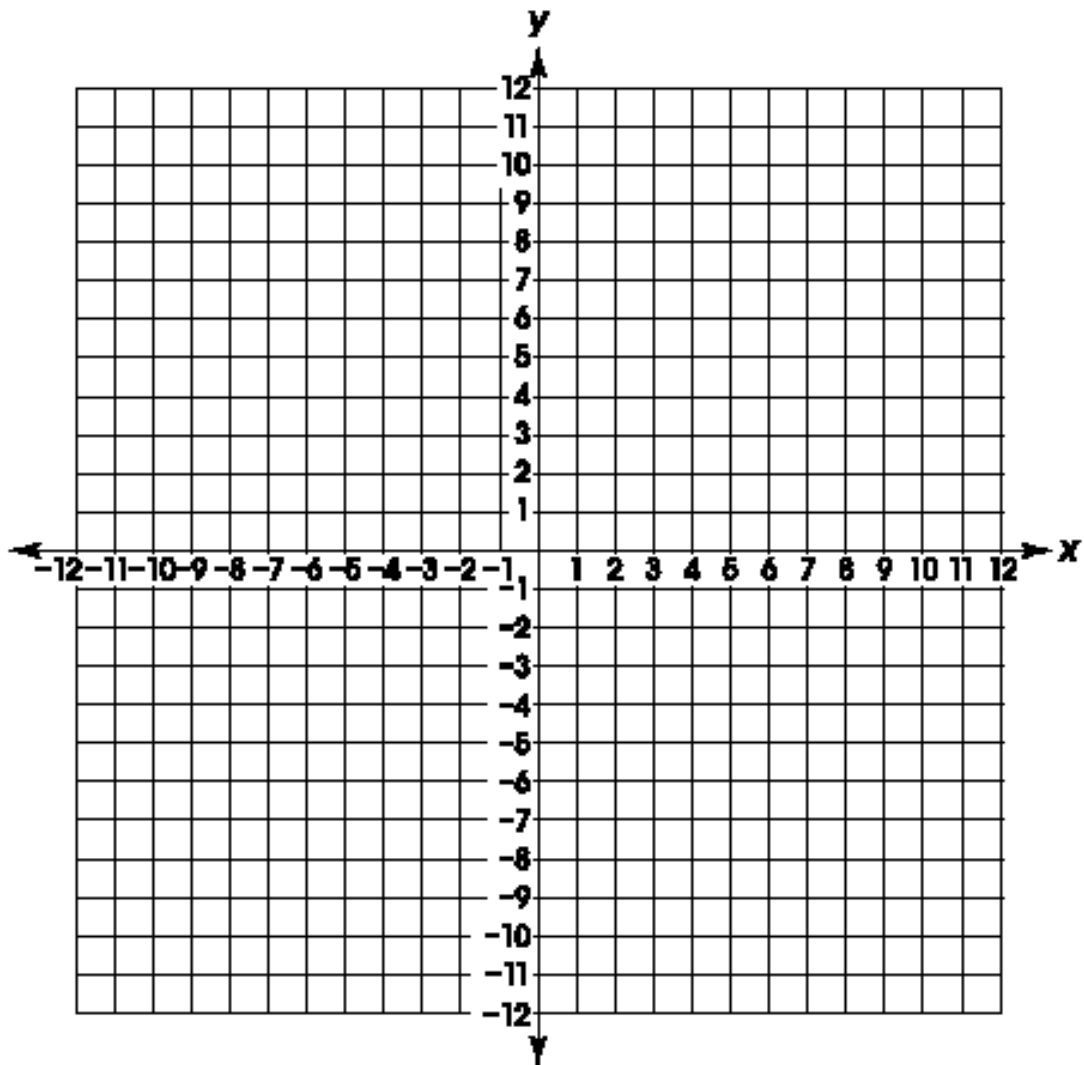


These points are three vertices of a parallelogram. What are the coordinates of the fourth vertex of parallelogram PQRS?

- A. (4, 6)
- B. (5, 2)
- C. (8, -1)
- D. (9, 1)

Question 35
Benchmark D
Spring 2005

35. The vertices of a quadrilateral are
(2, 2), (4, 6), (8, 2), and (10, 6).

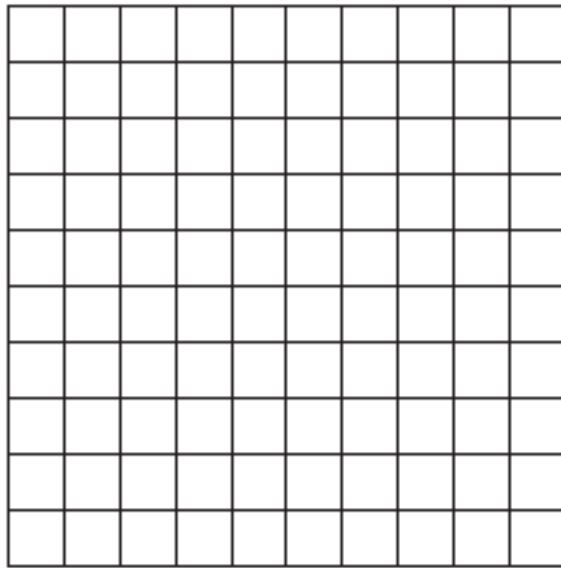


Which describes this quadrilateral?

- A. parallelogram
- B. rectangle
- C. rhombus
- D. square

Question 41
Benchmark D
Spring 2005

41. An electronics engineer is programming the computer that controls the circuit board cutting tools. He enters the coordinates of the vertices of a rectangular circuit board. The first three coordinates are $(2, 0)$, $(2, 6)$ and $(6, 6)$.

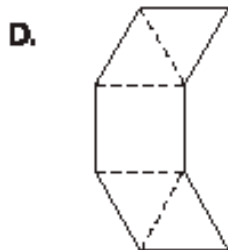
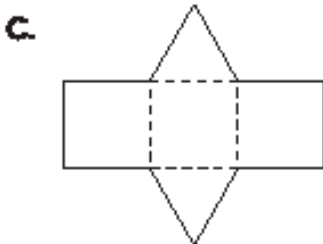
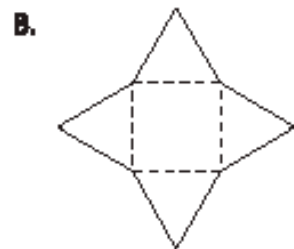
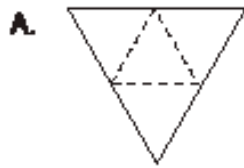


What are the coordinates of the fourth vertex?

- A. $(0, 2)$
- B. $(0, 6)$
- C. $(6, 0)$
- D. $(6, 2)$

Question 13
Benchmark E
Spring 2003

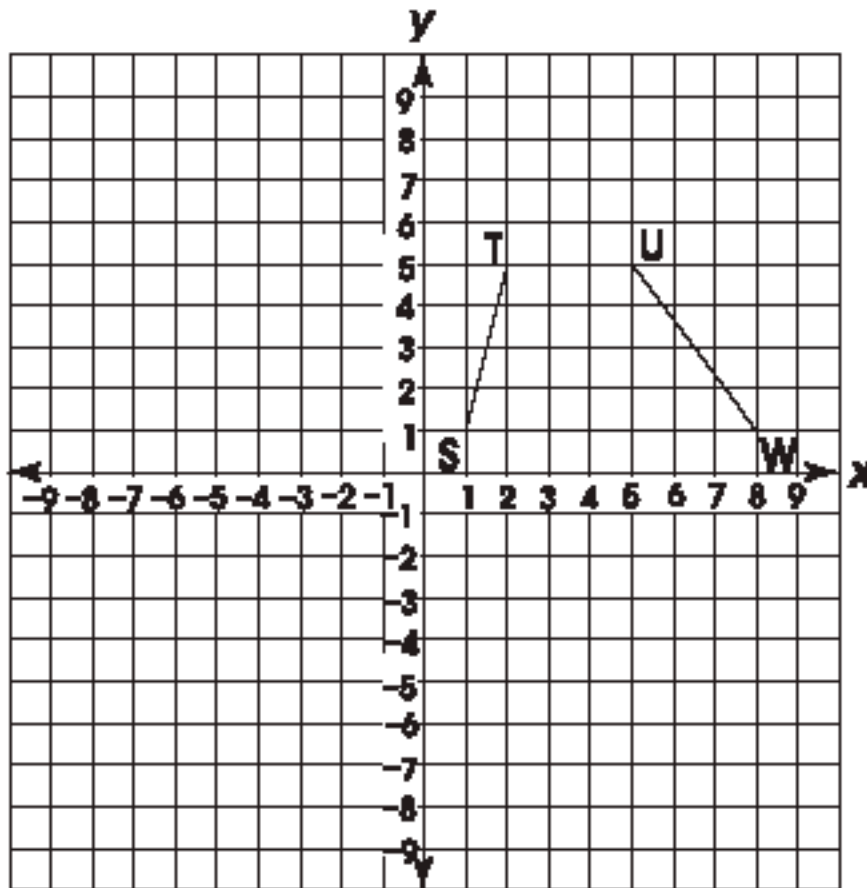
13. Penny needs to make a model of an Egyptian pyramid for her history class. She plans to cut a shape out of thick cardboard and then fold it to make a pyramid with a square base. Which of these nets or shapes could Penny use to make her model?



Question 28
Benchmark F
Spring 2003

10th Mathematics Ohio Graduation Tests
Geometry and Spatial Sense Standard

28. The quadrilateral STUW has vertices at the coordinates (1, 1), (2, 5), (5, 5), and (8, 1), as shown.



What are the coordinates of the vertices of quadrilateral STUW when it is reflected over the x -axis?

- A. (1, 1), (2, 5), (5, 5), (8, 1)
- B. (-1, 1), (-2, 5), (-5, 5), (-8, 1)
- C. (-1, -1), (-2, -5), (-5, -5), (-8, -1)
- D. (1, -1), (2, -5), (5, -5), (8, -1)

Question 10
Benchmark F
Spring 2004

10. Triangle DEF has vertices with coordinates D(-2, 1), E(1, 5) and F(2, 3).

In your **Answer Document**, draw and label triangle DEF on the grid provided.

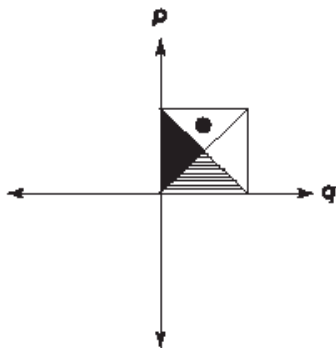
Draw the triangle D'E'F' by translating each vertex of triangle DEF three units to the right and two units down. Appropriately label triangle D'E'F'.

Draw the triangle D''E''F'' by translating each vertex of triangle D'E'F' two units to the left and seven units up. Appropriately label triangle D''E''F''.

Describe the movements necessary to perform a single translation of each vertex from triangle DEF to triangle D''E''F''.

Question 6
Benchmark F
Spring 2005

6. By the end of summer vacation, Callie had completed one-fourth of a quilt, as shown in the diagram below.

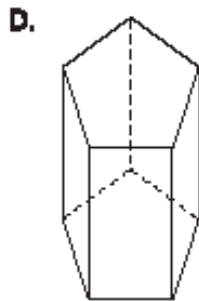
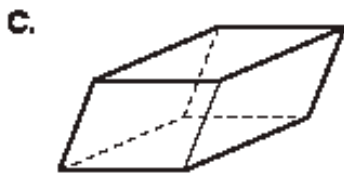
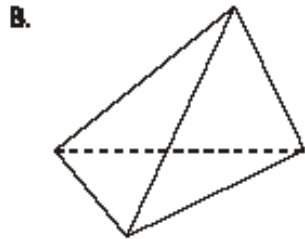
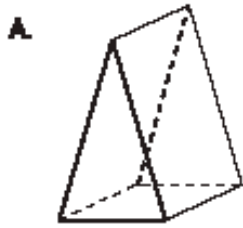


To finish the quilt, Callie plans to reflect the design of the completed portion over lines p and q until all 4 portions are complete.

In your **Answer Document**, copy the diagram above. Add the reflections of the completed portion of the quilt on the same sketch to show how the entire quilt will look when it is finished.

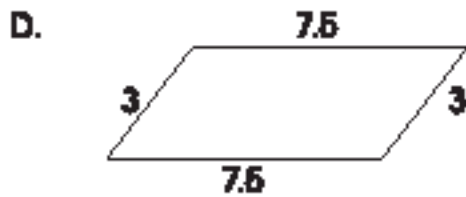
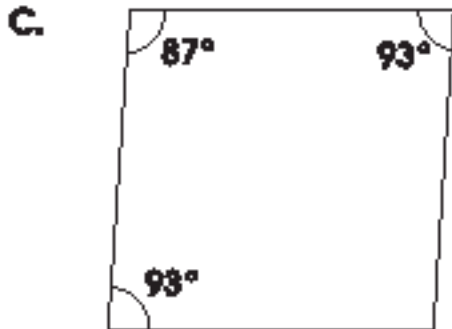
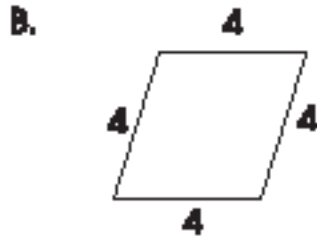
Question 7
Benchmark H
Spring 2003

7. Josie claimed that all polyhedra have more vertices than faces. Which of these polyhedra shows that Josie's statement is **not** always true?



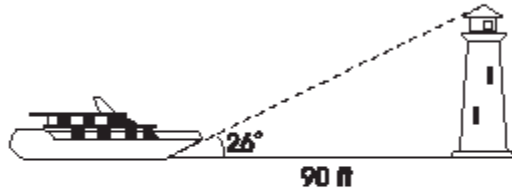
Question 33
Benchmark H
Spring 2004

33. Which figure is **not** a parallelogram?



Question 40
Benchmark I
Spring 2003

40. A yacht is anchored 90 feet offshore from the base of a lighthouse. The angle of elevation from the boat to the top of the lighthouse is 26 degrees. The distance between the yacht and the top of the lighthouse is about 100 feet.

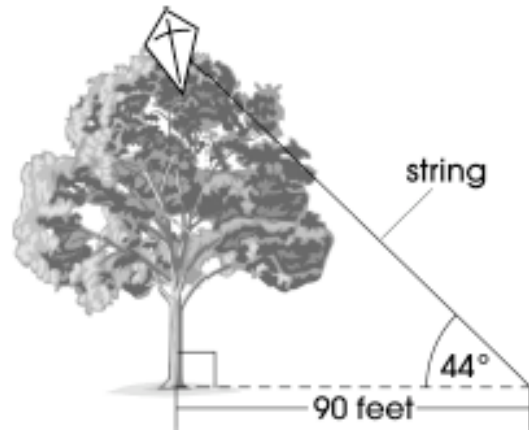


Which of these is nearest to the height of the lighthouse?

- A. 25 feet
- B. 45 feet
- C. 110 feet
- D. 135 feet

Question 15
Benchmark I
Spring 2005

15. Susan is flying a kite behind her house. She drops her string holder, and the kite gets caught in the top of a tree.



If the string makes a 44° angle with the ground, and the holder is 90 feet from the base of the tree, how tall is the tree, rounded to the nearest whole foot?

- A. 63 feet
- B. 65 feet
- C. 74 feet
- D. 87 feet