

MATH CONTENT TOPICS: Q.2.a, Q.2.e, Q.4.a, Q.4.c, Q.4.d, A.2.a, A.2.b, A.2.c  
MATH PRACTICES: MP.1.a, MP.1.b, MP.1.d, MP.1.e, MP.2.a, MP.2.b, MP.2.c, MP.4.a, MP.4.b, MP.5.a, MP.5.b

## 1 Review the Skill

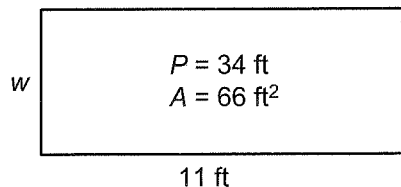
A **triangle** is a closed three-sided figure with three angles or corners. The **area** of a triangle is  $\frac{1}{2}bh$ , where  $b$  is the base and  $h$  is the height. The **perimeter** of a triangle is the sum of its side lengths.

A **quadrilateral** is a closed four-sided figure with four angles. The sides of a quadrilateral may or may not be congruent or parallel. The perimeter of a quadrilateral is the sum of its side lengths. If the quadrilateral has two or more congruent sides, a formula can be used to find its perimeter. Use a formula to find the area of a rectangle ( $A = lw$ ), a square ( $A = s^2$ ), or a parallelogram ( $A = bh$ ).

## 2 Refine the Skill

By refining the skill of computing the area and perimeter of triangles and quadrilaterals, you will improve your study and test-taking abilities, especially as they relate to the GED® Mathematical Reasoning Test. Study the information below. Then answer the questions that follow.

**a** To find the missing measure, use inverse operations to isolate the variable. Then perform the same operations on each side of the equals sign to keep the equation balanced.



### Rectangle

$$\text{Perimeter} = 2l + 2w$$

$$34 = 2(11) + 2w$$

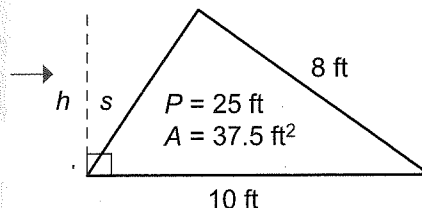
$$34 = 22 + 2w$$

**a**  $12 = 2w \rightarrow w = 6 \text{ ft}$

$$\text{Area} = lw$$

$$66 = 11w \rightarrow w = 6$$

**b** The height of an acute or isosceles triangle, or of a parallelogram, may be shown as a line perpendicular to the base. The line can be shown inside or outside of the figure.



### Triangle

$$\text{Perimeter} = \text{side} + \text{side} + \text{side}$$

$$25 = 10 + 8 + s$$

$$25 = 18 + s \rightarrow s = 7$$

$$\text{Area} = \frac{1}{2}bh$$

$$37.5 = \frac{1}{2}(10)(h)$$

$$37.5 = 5h \rightarrow h = 7.5$$

**c** An isosceles triangle has at least 2 congruent sides. Since the perimeter of a triangle is the sum of its side lengths, you can find the length of one congruent side by subtracting the length of the base from the perimeter and dividing the difference by 2.

### TEST-TAKING TIPS

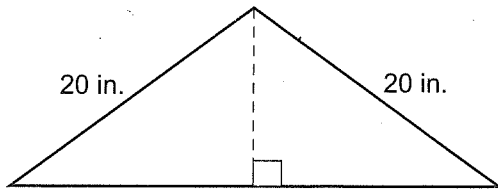
The information needed to solve geometry problems may be provided in the question, the diagram, or both. Ensure that you carefully study both the question and the diagram.

- What is the side length of a square with the same perimeter as the rectangle above?
  - 8.5 ft
  - 16.5 ft
  - 17 ft
  - 34 ft
- An isosceles triangle with a base of 8 cm has a perimeter of 28 cm. Which could be the length of each of the other two sides?
  - 6 cm
  - 10 cm
  - 18 cm
  - 20 cm

### 3 Master the Skill

## ★ Spotlighted Item: FILL-IN-THE-BLANK

**DIRECTIONS:** Study the figure and information and read each question. Then fill in your answer in the box below.



The perimeter of the triangle is 64 in.  
The area of the triangle is  $192 \text{ in.}^2$

3. What is the base of the triangle?

 in.

4. What is the height of the triangle?

 in.

**DIRECTIONS:** Read each question. Then fill in your answer in the box below.

5. A right triangle has an area of  $30 \text{ cm}^2$ . One of the sides that forms the right angle is 15 cm long. How long is the other side that forms the right angle?

 cm

6. The length of a rectangle is 2 times its width. The area of the rectangle is  $32 \text{ in.}^2$ . What is the length of the rectangle?

 in.

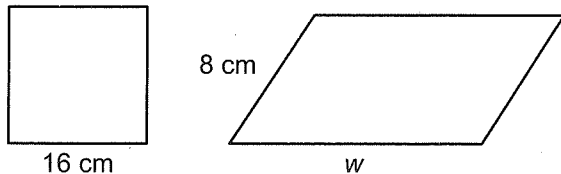
7. A quilt is made up of squares, each with an area of  $\frac{1}{4} \text{ ft}^2$ . The squares are arranged in

12 rows of 10 squares each. The edge of the quilt is bordered with ribbon. What length of ribbon is required to border the quilt?

 ft

**DIRECTIONS:** Study the figures and information, read the question, and choose the **best** answer.

The square and the parallelogram below have the same perimeter.

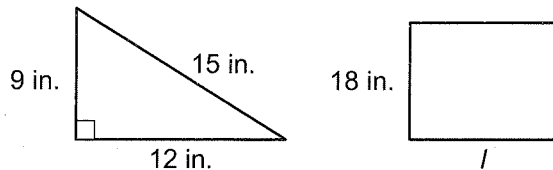


8. What is the perimeter of each figure?

- A. 32 cm
- B. 48 cm
- C. 64 cm
- D. 128 cm

**DIRECTIONS:** Study the figures and information, read the question, and choose the **best** answer.

The two figures below have the same area.

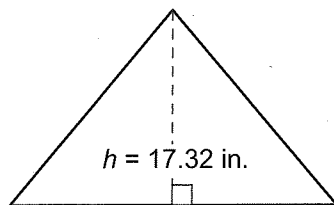


9. What is the area of each figure?

- A.  $54 \text{ in.}^2$
- B.  $90 \text{ in.}^2$
- C.  $108 \text{ in.}^2$
- D.  $180 \text{ in.}^2$

### 3 Master the Skill

**DIRECTIONS:** Study the figure, read each question, and choose the **best** answer.



$$A = 86.6 \text{ in.}^2$$

10. What is the base of the triangle above?
- A. 5 in.
  - B. 10 in.
  - C. 15 in.
  - D. 20 in.
11. The triangle above is an equilateral triangle. What is the perimeter of the triangle?
- A. 15 in.
  - B. 20 in.
  - C. 30 in.
  - D. 40 in.

**DIRECTIONS:** Read each question, and choose the **best** answer.

12. A parallelogram has an area of 58 square meters and a base of 5 meters. What is the height of the parallelogram?
- A. 5.8 m
  - B. 11.6 m
  - C. 24 m
  - D. 26.5 m
13. What is the side length of a square with perimeter 0.5 meter?
- A. 0.125 m
  - B. 0.25 m
  - C. 1 m
  - D. 2 m
14. Mary bought a cover for her rectangular swimming pool for \$76.80. The material for the cover cost \$0.15 per square foot. Her pool is 32 feet long. How wide is her swimming pool?
- A. 16 feet
  - B. 24 feet
  - C. 44.8 feet
  - D. 51.6 feet

15. Kevin is buying a rectangular rug. He wants the rug to have an area between 30 and 40 square feet, and the length must be 7 feet. Which could be the width of the rug?

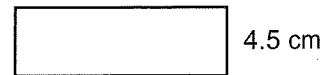
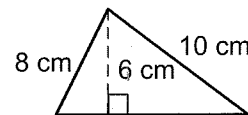
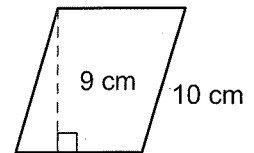
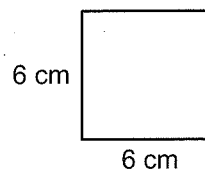
- A. 3.9 feet
- B. 4.4 feet
- C. 5.8 feet
- D. 6.2 feet

16. The perimeter of a rectangle is greater than its area. The rectangle has a perimeter of 24 feet. Which could be the length?

- A. 2 ft
- B. 3 ft
- C. 4 ft
- D. 5 ft

**DIRECTIONS:** Study the figures and information, read each question, and choose the **best** answer.

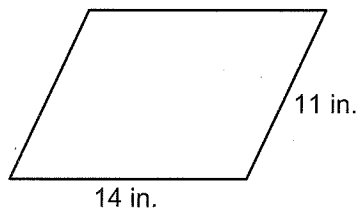
The four figures below have the same area.



17. Which dimension has a value of 12 cm?
- A. base of triangle
  - B. length of square
  - C. length of rectangle
  - D. width of parallelogram
18. Which figure has a perimeter of 25 cm?
- A. parallelogram
  - B. rectangle
  - C. square
  - D. triangle
19. Which figure has the greatest difference between its area and perimeter?
- A. parallelogram
  - B. rectangle
  - C. square
  - D. triangle

**DIRECTIONS:** Study the figure, read the question, and choose the **best** answer.

20. Examine the parallelogram.

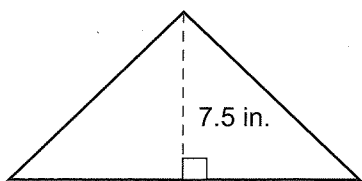


Which statement is correct?

- A. The perimeter of the parallelogram is 25 in., because  $11 + 14 = 25$ .
- B. The area of the parallelogram is  $154 \text{ in.}^2$ , because  $11 \times 14 = 154$ .
- C. The area of the parallelogram is  $77 \text{ in.}^2$ , because  $\frac{1}{2}(11)(14) = 77$ .
- D. The perimeter of the parallelogram is 50 in., because  $2(11) + 2(14) = 50$ .

**DIRECTIONS:** Examine the information and the figure, read the question, and choose the **best** answer.

21. The isosceles triangle below is cut in half so that the height of each right triangle is the same as the isosceles triangle, and the base of each right triangle is one-half the base of the original triangle.

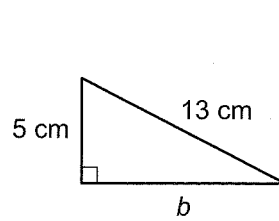


The area of the isosceles triangle is 75 square inches. What is the base of each right triangle?

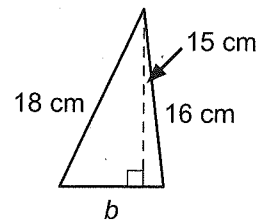
- A. 10 in.
- B. 15 in.
- C. 37.5 in.
- D. 20 in.

**DIRECTIONS:** Study the figures and information, read each question, and choose the **best** answer.

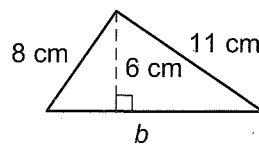
Each triangle has an area of  $30 \text{ cm}^2$ .



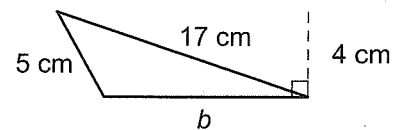
**Triangle 1**



**Triangle 2**



**Triangle 3**



**Triangle 4**

22. Which triangle has the longest base?

- A. Triangle 1
- B. Triangle 2
- C. Triangle 3
- D. Triangle 4

23. Which triangle has the greatest perimeter?

- A. Triangle 1
- B. Triangle 2
- C. Triangle 3
- D. Triangle 4

**DIRECTIONS:** Read each question, and choose the **best** answer.

24. Which of the following figures has the greatest width?

- A. rectangle with area of 32 and length of 6
- B. rectangle with area of 40 and length of 7
- C. rectangle with area of 45 and length of 8
- D. rectangle with area of 50 and length of 9

25. An isosceles triangle has a perimeter of 48 and one side length of 12. All of the following figures could be the length of one of the other two sides **except** which one?

- A. 12
- B. 18
- C. 24
- D. 30