

Area of Composite Shapes

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CONCEPT

1

Area of Composite Shapes

Here you'll learn how to find the area of a composite shape.

What if you wanted to find the area of a shape that was made up of other shapes? How could you use your knowledge of the area of rectangles, parallelograms, and triangles to help you? After completing this Concept, you'll be able to answer questions like these.

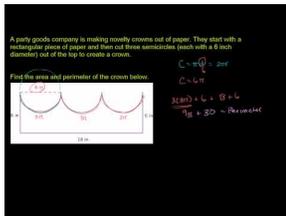
Watch This



MEDIA

Click image to the left for more content.

[CK-12 Foundation: Chapter10AreaofCompositeShapesA](#)



MEDIA

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[KhanAcademy: Area and Perimeterof Composite Figures](#)

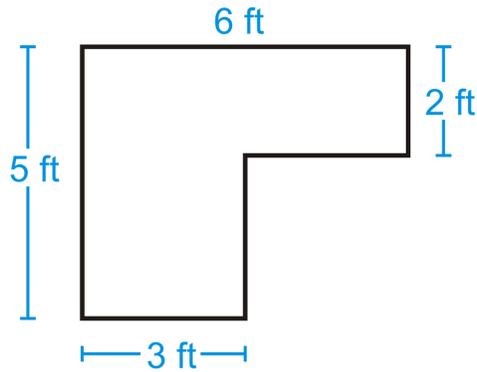
Guidance

Perimeter is the distance around a shape. The perimeter of any figure must have a unit of measurement attached to it. If no specific units are given (feet, inches, centimeters, etc), write “units.” **Area** is the amount of space inside a figure. If two figures are congruent, they have the same area. This is the **congruent areas postulate**. This postulate needs no proof because congruent figures have the same amount of space inside them. Keep in mind that two figures with the same area are not necessarily congruent.

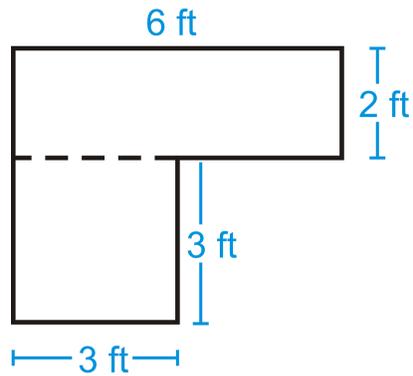
A **composite shape** is a shape made up of other shapes. To find the area of such a shape, simply find the area of each part and add them up. The **area addition postulate** states that if a figure is composed of two or more parts that do not overlap each other, then the area of the figure is the sum of the areas of the parts.

Example A

Find the area of the figure below. You may assume all sides are perpendicular.



Split the shape into two rectangles and find the area of each.

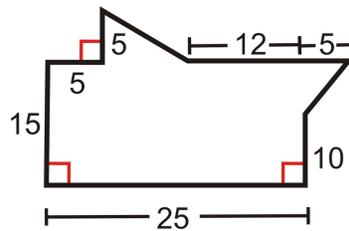


$$A_{\text{top rectangle}} = 6 \cdot 2 = 12 \text{ ft}^2$$

$$A_{\text{bottom square}} = 3 \cdot 3 = 9 \text{ ft}^2$$

The total area is $12 + 9 = 21 \text{ ft}^2$.

Example B



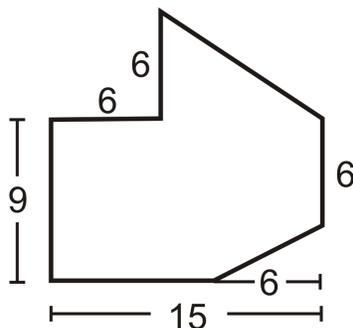
- Divide the shape into two triangles and one rectangle.
- Find the area of the two triangles and rectangle.
- Find the area of the entire shape.

Solution:

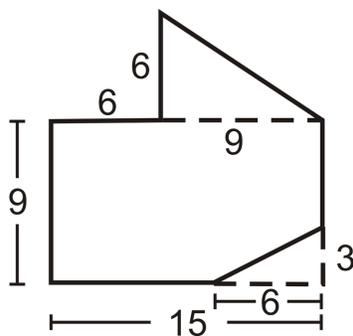
- One triangle on the top and one on the right. Rectangle is the rest.
- Area of triangle on top is $\frac{8(5)}{2} = 20 \text{ units}^2$. Area of triangle on right is $\frac{5(5)}{2} = 12.5 \text{ units}^2$. Area of rectangle is 375 units^2 .
- Total area is 407.5 units^2 .

Example C

Find the area of the figure below.



Divide the figure into a triangle and a rectangle with a small rectangle cut out of the lower right-hand corner.



$$A = A_{\text{top triangle}} + A_{\text{rectangle}} - A_{\text{small triangle}}$$

$$A = \left(\frac{1}{2} \cdot 6 \cdot 9 \right) + (9 \cdot 15) - \left(\frac{1}{2} \cdot 3 \cdot 6 \right)$$

$$A = 27 + 135 - 9$$

$$A = 153 \text{ units}^2$$

Watch this video for help with the Examples above.



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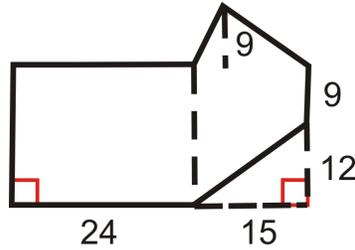
Click image to the left for more content.

[CK-12 Foundation: Chapter10AreaofCompositeShapesB](#)

Vocabulary

Perimeter is the distance around a shape. The perimeter of any figure must have a unit of measurement attached to it. If no specific units are given (feet, inches, centimeters, etc), write “units.” **Area** is the amount of space inside a figure and is measured in square units. A **composite shape** is a shape made up of other shapes.

Guided Practice



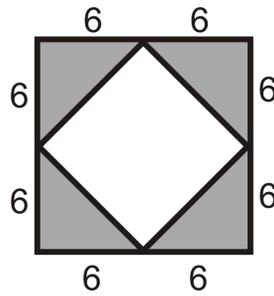
1. Find the area of the rectangles and triangle.
2. Find the area of the whole shape.

Answers:

1. Rectangle #1: Area = $24(9 + 12) = 504 \text{ units}^2$. Rectangle #2: Area = $15(9 + 12) = 315 \text{ units}^2$. Triangle: Area = $\frac{15(9)}{2} = 67.5 \text{ units}^2$.
2. You need to subtract the area of the triangle from the bottom right corner. Total Area = $504 + 315 + 67.5 - \frac{15(12)}{2} = 796.5 \text{ units}^2$

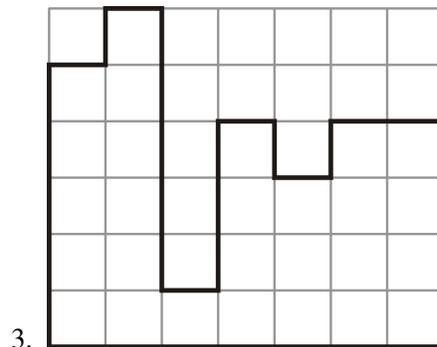
Practice

Use the picture below for questions 1-2. Both figures are squares.

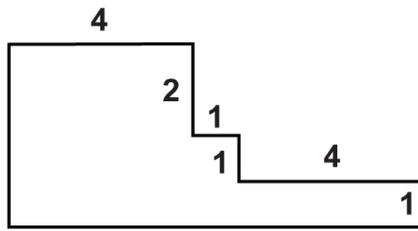


1. Find the area of the unshaded region.
2. Find the area of the shaded region.

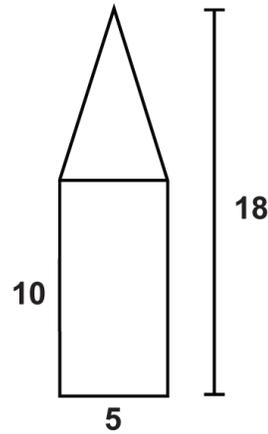
Find the area of the figure below. You may assume all sides are perpendicular.



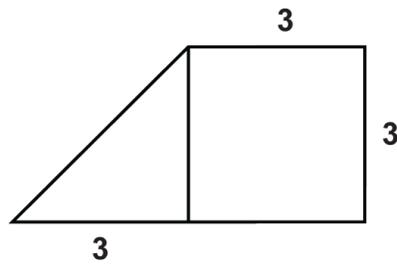
Find the areas of the composite figures.



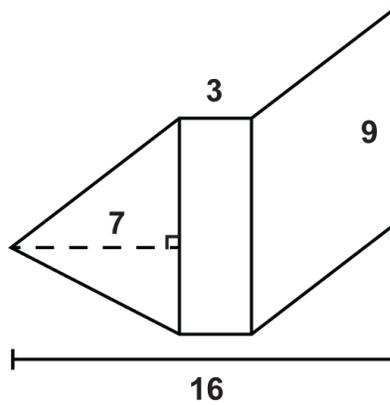
4.



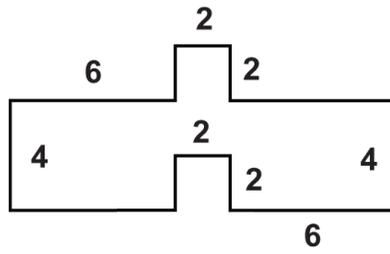
5.



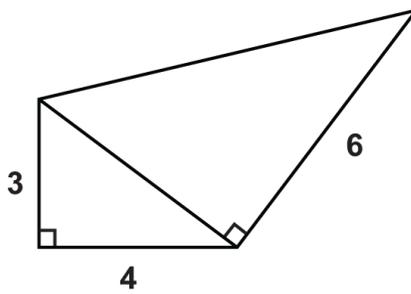
6.



7.

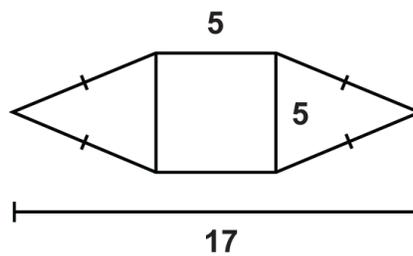


8.



9.

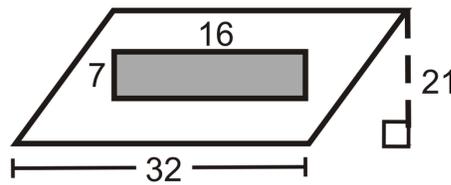
Use the figure to answer the questions.



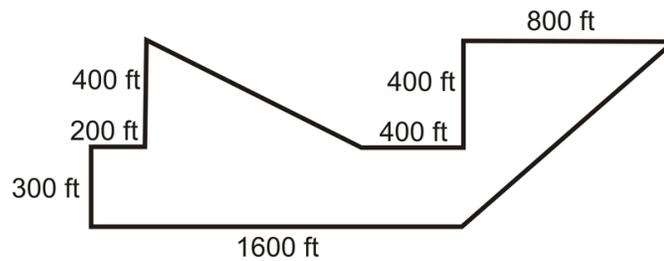
10. What is the area of the square?
11. What is the area of the triangle on the left?
12. What is the area of the composite figure?

Find the area of the following figures.

13. Find the area of the unshaded region.



14. Lin bought a tract of land for a new apartment complex. The drawing below shows the measurements of the sides of the tract. Approximately how many acres of land did Lin buy? You may assume any angles that look like right angles are 90° . (1 acre \approx 40,000 square feet)



15. Linus has 100 ft of fencing to use in order to enclose a 1200 square foot rectangular pig pen. The pig pen is adjacent to the barn so he only needs to form three sides of the rectangular area as shown below. What dimensions should the pen be?

