



Geometry Journey Video Series

Program #7

Perimeter & Area

**Satellite Broadcasting
VHS
and Internet/Intranet Streaming**



Topic

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Program #7 - Perimeter & Area

Program Description

This video is designed to help students develop a powerful, mental process to derive every formula for calculating perimeters and areas. It shows how to start from one simple concept, a square unit, to arrive at the method for calculating the areas of all planar shapes. Once a student visualizes the process for deriving a formula, burdensome formula memorization is no longer required.

This program is the #7 episode in the fifteen 15-minute Geometry Journey Series.

Synopsis

This program will cover the following topics:

1. Perimeter
2. Introduction to Area
3. Area of A Square or A Rectangle
4. Area of A Parallelogram
5. Area of A Triangle
6. Area of A Trapezoid

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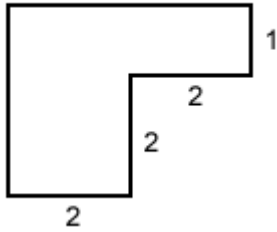
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Student Worksheet

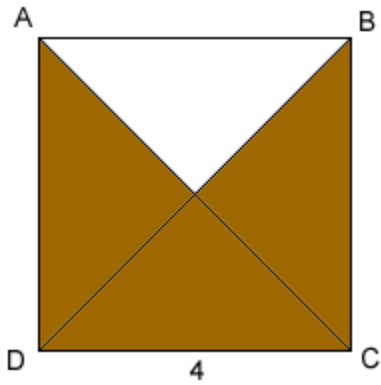
Name _____

1) What is the perimeter of the figure shown in the picture? All adjacent sides are perpendicular to each other.



2) What is the area of the figure in question 1)?

3) ABCD is a square with sides 4. What is the area of the shaded region?



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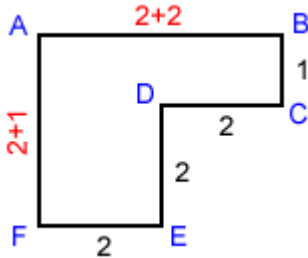
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Discussion Questions

Question: How can we approximate the area of the shaded region under a curve?



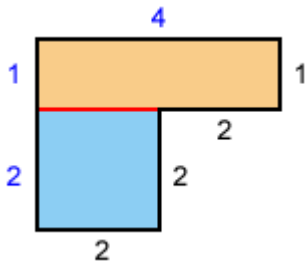
1) What is the perimeter of the figure shown in the picture? All adjacent sides are perpendicular to each other.



The perimeter of a polygon is the sum of the lengths of its sides. As shown, the missing length $AB = 2+2 = 4$ and $FA = 2+1 = 3$. Therefore,

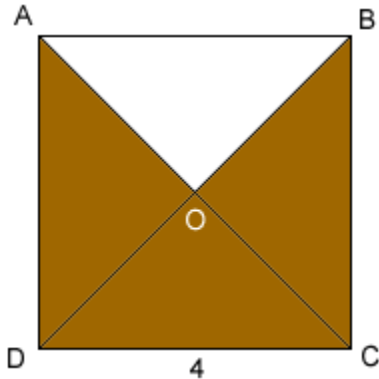
$$\text{Perimeter} = AB + BC + CD + DE + EF + FA = 4+1+2+2+2+3 = 14.$$

2) What is the area of the figure in question 1)?



Answer: As shown, the figure consists of a rectangle with sides 1 and 4 and a square with sides 2. Therefore, the area of the figure $= 1 \times 4 + 2 \times 2 = 4 + 4 = 8$.

3) ABCD is a square with sides 4. What is the area of the shaded region?

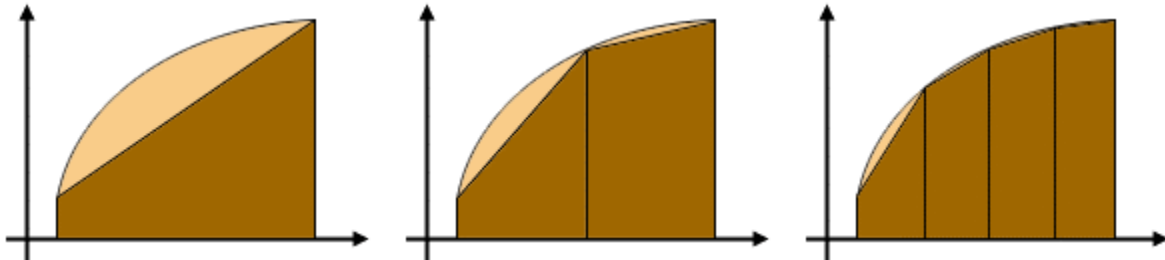


Answer 1: The shaded area $= (3/4)$ area of square $= (3/4) (4 \times 4) = 12$.

Answer 2: The shaded area $=$ area of square $-$ area of triangle AOB $= 4 \times 4 - [(1/2) (4 \times 2)] = 12$.

Hints to Discussion Questions

Question: How can we approximate the area of the shaded region under a curve?



Hints: We can use the area of a trapezoid to approximate the area of the shaded region under a curve because we know how to calculate the area of the trapezoid.

As shown by the figures, we can improve the approximation of the shaded area by dividing the area under the curve into more trapezoids. The more trapezoids we use, the more accurate the approximation.