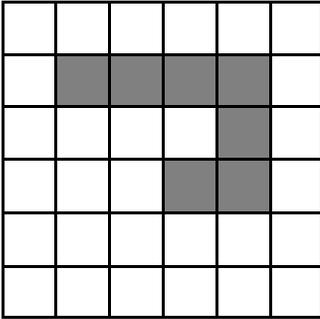


Materials: unit cubes or centimeter/gram cubes, ruler

Grid paper and unit cubes are common models for perimeter and area and volume problems.  
 Each side of a grid square or edge of a cube = 1 length unit. = 1 cm  
 Each square on the grid or surface of the cube = 1 area unit = 1 sq cm

example:



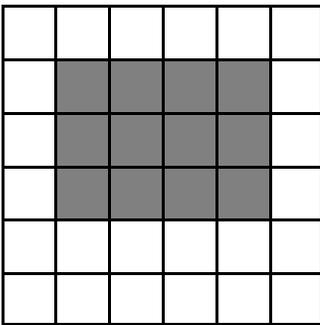
This polygon has

$$\text{perimeter} = 1 + 4 + 3 + 2 + 1 + 1 + 1 + 3 = 16$$

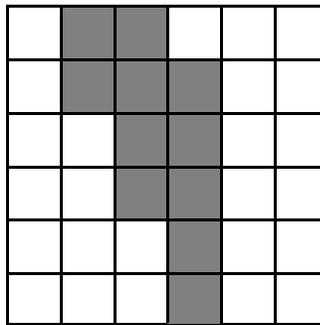
$$\text{area} = 7 \text{ square units}$$

1. For each figure: Compute the perimeter by counting the number of length units )))

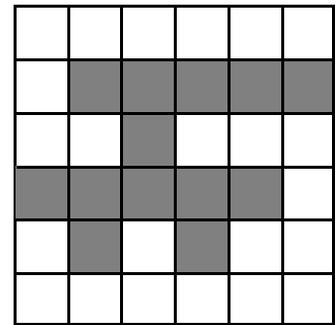
Compute the area by counting the number of area units



P= \_\_\_\_\_ A= \_\_\_\_\_

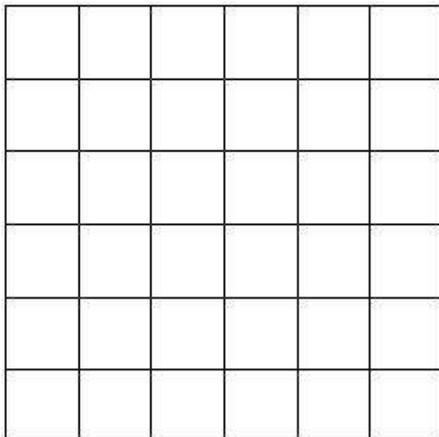


P= \_\_\_\_\_ A= \_\_\_\_\_



P= \_\_\_\_\_ A= \_\_\_\_\_

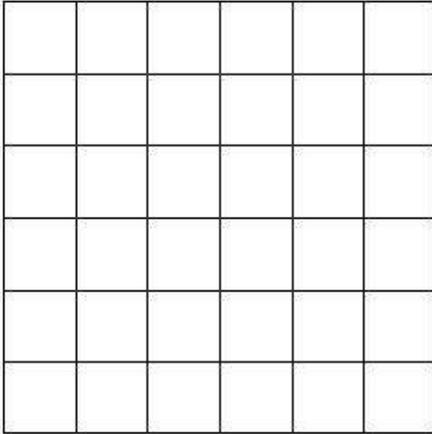
2. Construct a rectangle with length = 5 and width = 3. Sketch it on the grid.



The perimeter of the rectangle = \_\_\_\_\_

The area of the rectangle = \_\_\_\_\_

3. Construct a rectangle with perimeter of 12 units. Sketch it on the grid.

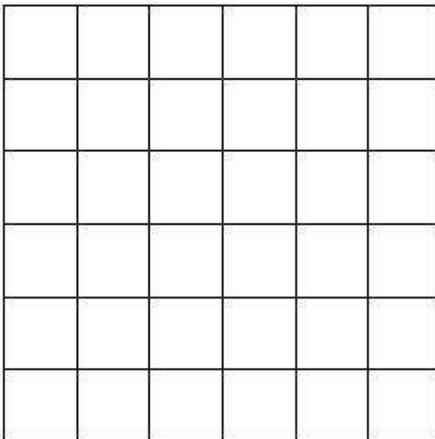


What is its length? \_\_\_\_\_  
 What is its width? \_\_\_\_\_  
 What is its area? \_\_\_\_\_

Divide the rectangle into two triangles by connecting two opposite vertices with a line segment.

What is the base measure of each triangle? \_\_\_\_\_  
 What is the height of each triangle? \_\_\_\_\_  
 What is the area of each triangle? \_\_\_\_\_

4. On the grid sketch a parallelogram by selecting four grid points as vertices.



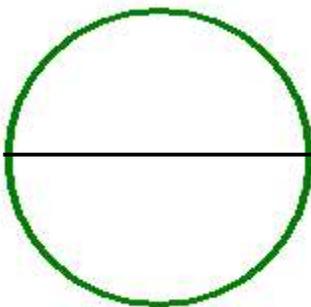
What is the measure of its base? \_\_\_\_\_  
 What is the measure of its height? \_\_\_\_\_  
 What is its area? \_\_\_\_\_

Divide the parallelogram into two triangles by connecting two opposite vertices with a line segment.

What is the base measure of each triangle? \_\_\_\_\_  
 What is the height measure of each triangle? \_\_\_\_\_  
 What is the area of each triangle? \_\_\_\_\_

5. Unit cubes or cm/g cubes can be used to measure both straight line segments and curved lines. Each edge of a cube measures 1 centimeter. The cubes are placed as close together as possible. The number of cubes needed to cover the line is the length of the line.

Use unit cubes  to measure the diameter and circumference of the circle.



Complete the table below to get an approximate value for the ratio  $C/D =$  .

Number of unit cubes in circumference \_\_\_\_\_  
 Number of unit cubes in diameter \_\_\_\_\_  
 Ratio  $C/D =$  \_\_\_\_\_

6. Volume:

Use at least 20 unit cubes or cm/gram cubes to build a rectangular solid.  
 Answer the following questions about your model.

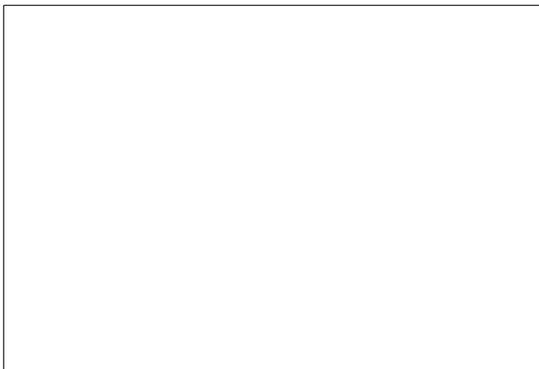
Sketch it here:



# vertices = \_\_\_\_\_ #edges = \_\_\_\_\_ #sides = \_\_\_\_\_  
 L = \_\_\_\_\_ W = \_\_\_\_\_ H = \_\_\_\_\_  
 perimeters of each side: \_\_\_\_\_  
 surface area of each side: \_\_\_\_\_  
 total surface area : \_\_\_\_\_  
 volume = L X W X H = \_\_\_\_\_

7. Use unit cubes to construct a rectangular solid with a volume of 24 cubic units.  
 Answer the following questions about your model.

Sketch it here:



L = \_\_\_\_\_ W = \_\_\_\_\_ H = \_\_\_\_\_  
 perimeters of each side: \_\_\_\_\_  
 surface area of each side: \_\_\_\_\_  
 total surface area : \_\_\_\_\_

8. Construct three different models of any shape with a volume of 8 cubic units.

Complete the table:

	Model 1	Model 2	Model 3
# vertices			
# edges			
# sides			
Length of shortest side			
Length of longest side			
Total Surface Area			

Describe any patterns you observe. \_\_\_\_\_  
 \_\_\_\_\_