**Chapter 9 Notes - Perimeter, Circumference, and Area**

**9-1 Perimeter and Circumference**

**Perimeter** is the distance around the outside edge of an object. A Capital “P” is used for the word. To find the perimeter of an object, you add the lengths of each side.

12 cm

P =

6 cm

10 cm

A rectangle’s perimeter is equal twice the length added to twice the width.

**P** = 2 l + 2 w

**P** =

5 cm

16 cm

The distance around a circle is called the **circumference.** The formula for the circumference is equal to the diameter (distance across the circle) times π (pi) a constant number equal to **3.14.**

d = 8 cm

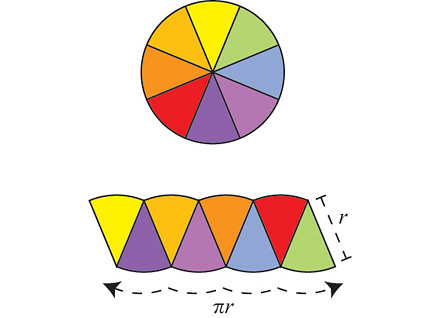
**C** = πd

**C** = 2πr

r = 4 cm

**9-2 Area of Circles**

The **Area** of an object is equal to the length times the width. If a circle is cut into pie slices and rearranged into a rectangle, you find that its width is equal to its radius (r) and the length is equal to ½ its Circumference.



The final formula can be written as:

r = 4 cm

**A** = πr2 = π•r•r

**A** =

**A** =

d = 9 cm

**9-3 Area of Irregular Figures**

A **Composite** figure is made up of simple geometric shapes like rectangles, triangles, circles, and semi-circles. You can find a composite figure’s area by dividing it up into non-overlapping geometric shapes, and computing each shape’s area, then adding them together.

Ex:

6 cm

+

+

=

5 cm

Areacircle (half of it) =

Arearectangle =

Areatriangle = (1/2 area of rectangle) =

**9-4 Introduction to Three-dimensional Figures**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **# of**  **dimensions** | 1 | 1 | 2 | 3 |
| **name** | point | line | plane | solid |
| **example** |  |  |  |  |
| **Ways to measure**  **(units used)** | counting  (number) | Length  (cm) | Perimeter  (cm)  **P** = w+l+w+l  (cm)  l  w | Surface Area (cm2)  **S.A. =**  2(l•h)+  2(l•w)+  2(w•h)+  h  l  w |
|  | coordinates  D4  1 2 3 4 5  F  E  D  C  B  A   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | | Angle  (degrees°) | Area  (cm2)  **A**= w• l  l  w | Volume  (cm3)  **V**= w•l•h  = b•h  h  l  w |

Three dimensional figures are measured in: length, width, height.

A flat surface on a 3-D figure is called a **face**, and the line where two faces meet is called an **edge**. A point where three or more lines meet on a 3-D figure is called a **vertex**. **Polyhedrons** are 3-D figures whose faces are all polygons. The face that is used to name the polyhedron is called its **base**. **Prisms** are polyhedrons with 2 parallel equal faces. **Pyramids** are polyhedrons that have one base and rise to a single vertex.

|  |  |  |  |
| --- | --- | --- | --- |
| **figure** | **name** | **figure** | **name** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**9-5 Volume of Prisms and Cylinders**

The **volume** of a prism is equal to its base times its height. **V =** b• h

8 cm

10 cm

12 cm

3 in

15 in

6 cm

6 cm

4 in

The **volume** of composite figures is equal to the sum of each figure’s volume.

6 cm

10 cm

16 cm

4 cm

10 cm

**9-6 Surface Area of Prisms and Cylinders**

To calculate the **Surface Area** of a figure, you first must lay it out flat to show the shape of each side. This flat figure is called a **net**. You then can add up the area of each shape in the net to find the total Surface Area.

3 in

2 in

8 in

3 cm

5 cm

5 cm

12 cm

8 cm

6 cm

12 cm