GEOMETRY FORMULA SHEET!!

Geometry Formula Sheet

Geometric Formulas

- $A = \frac{1}{2}bh$  
  $A = \frac{1}{2} h(b_1 + b_2)$  
  $V = \frac{1}{3}Ah$  
  $L.A. = \frac{1}{2}p + \pi r^2$  
  $S.A. = L.A. + \pi r^2$

- $A = lw$  
  $p = 2(l + w)$  
  $A = \pi r^2$  
  $C = 2\pi r$  
  $V = \pi r^2h$  
  $L.A. = 2\pi rh$  
  $S.A. = 2\pi r(h + r)$  
  $V = \frac{4}{3}\pi r^3$  
  $S.A. = 4\pi r^2$

- $A = bh$  
  $V = wh$  
  $S.A. = 2lw + 2lh + 2wh$  
  $L.A. = \pi rl$  
  $S.A. = \pi r(l + r)$

- $c^2 = a^2 + b^2$

\( \circ \) = AREA of the base  
\( \bullet \) = Perimeter of the base
Chapter 12 - Area and Volume of Solids

Name ______________________

Review Perimeter and Areal

1.  
   ![Triangle]
   
   Area = \( \frac{\sqrt{3}}{4} (16)(\sqrt{3}) \)  
   Perimeter = 48  
   \( P = 16.3 \)

2.  
   ![Octagon]
   
   Area = 294 \( \sqrt{3} \)  
   (hint: break up into 6 eq triangles)  
   Perimeter = 84  
   \( P = 14.6 \)

3.  
   ![Right Triangle]
   
   Area = \( \frac{1}{2} (20)(15) \)  
   Perimeter = 60  
   \( P = 15 + 20 + 25 \)

4.  
   ![Circle]
   
   Area = 16\( \pi \)  
   \( A = \pi r^2 = 4^2 \pi \)  
   Circumference = 8\( \pi \)  
   \( C = 2\pi r = 2.4 \pi \)

**Types of Solids:**

- **Polyhedra**
  - **Prism**
  - **Pyramid**

- **Pentagonal prism**
  - Bases are pentagons.

- **Triangular pyramid**
  - Base is a triangle.

We use the **BASE** of the prism or pyramid to name the shape.

**Not Polyhedra**

- **Cylinder**
- **Cone**
- **Sphere**

But we will still be finding area and volume of these shapes!
LATERAL AND SURFACE AREA OF A PRISM and CYLINDER

**Lateral Area:** is the sum of the area of polyhedra’s sides (or faces).

**Surface Area:** is the sum of the area of ALL the polyhedra’s sides.

so ... lateral area PLUS area of the bases

---

\[
V = \frac{1}{2}bh \quad p = \text{perimeter of base}
\]

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![Diagram of a rectangular prism](image1)

![Diagram of a right triangular prism](image2)

![Diagram of a right cylinder](image3)
**Lateral Faces**: are parallelograms formed by connecting the corresponding vertices of the bases.

**Lateral Edges**: segments connecting the vertices.

**Bases**: how we name the figure

For prisms, they are the two parallel and congruent sides

**Surface Area**: is the sum of the area of ALL the polyhedra's sides.

The surface area of the prism is $S = 2(12) + 2(10) + 2(30) = 104 \text{ cm}^2$. 
12.2 LATERAL AREA AND SURFACE AREA OF PRISMS AND CYLINDERS

<table>
<thead>
<tr>
<th>Lateral Faces</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral Edges</td>
<td></td>
</tr>
<tr>
<td>Bases</td>
<td></td>
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</tbody>
</table>

**LATERAL AREA**

**SURFACE AREA**

Find the lateral area and surface area for each prism. **What is the base of each figure?** Outline it!

1. Base shape:  
   ![Base shape image](image1)
   
   \( L_A = h \cdot p = 7 \cdot 22 = 154 \)  
   \( S_A = L_A + 2B = 154 + 60 = 214 \)

2. Base shape:  
   ![Base shape image](image2)
   
   \( L_A = h \cdot p = 10 \cdot 30 = 300 \)  
   \( S_A = L_A + 2B = 300 + 60 = 360 \)

3. Base shape:  
   ![Base shape image](image3)

4. Base shape:  
   ![Base shape image](image4)
Find the lateral area and surface area of each cylinder.

\[
L \text{A} = 2\pi rh \\
= 4\pi \cdot 6 = 24\pi \\
S \text{A} = 2\pi r + 2B \\
= 24\pi + 8\pi = 32\pi
\]

Given the following surface area, find the unknown length in each figure

8. \(S = 326.73 \text{ cm}^2\)

9. \(S = 864 \text{ cm}^2\)

**HOMEWORK - 12.2 - LA & SA of prisms and cylinders**

Find the lateral area and surface area of the following cylinders or prisms. Find the exact answers rounded to the nearest hundredth. Outline the BASE of each figure.

1.

2.

3.

4.

5.

6.
12.4 VOLUME OF CYLINDERS AND PRISMS

VOLUME

Find the volume of the following figures.

   a) What is the base of each figure? Outline it!
   b) What is the value of B? (the area of the base)
   c) What is the height of the prism? (not of the base)
   d) Find the volume!