Bellwork  3/16/16

Find the area of the regular polygon

\[ A = \frac{1}{2} \alpha p = \frac{1}{2} (5 \sqrt{3})(5) = 18.5 \sqrt{3} \ m^2 \]

\[ = 314.4 \ m^2 \]

Section 11-1: Polyhedrons

Vocabulary

**Polyhedron** - Solid figure made up of polygons that enclose a region of space.

- No curves/rounded edges
- 3 – Dimensional

3 Parts of a Polyhedron

1. **Faces** : Flat surfaces or sides / polygons
2. **Edges** : Line segments formed when two faces intersect
3. **Vertices** : Points where 2 or more edges come together

Is this shape a polyhedron?

How many vertices, edges and faces are there on this figure?

V: 6
E: 10
F: 6
**Convex polyhedron** - Any two vertices can be connected by a line that lies entirely on or inside the polyhedron.
- No dents / caves.

**Net figure** - 2-D representation of a polyhedron
- Faces $\rightarrow$ Regions
- Vertices $\rightarrow$ Vertices (where two or more segments meet)
- Edges $\rightarrow$ Segments

**Find a hexagonal or octagonal prism**
How many vertices, edges, and faces does your prism have?

**Cross Section** - Intersection of a solid by a plane (flat).
- Described as a shape.
- Imagine cutting your shape along a plane. What would you see?

**Example 1**
Describe a cross section of a rectangular prism.

**Example 2**
Describe a cross section of a rectangular prism.
Cross Section
Describe a cross section of a rectangular prism.

Euler's Theorem
Euler theorem - The faces, vertices, and edges of a polyhedron are related by:
For polyhedrons: $F + V = E + 2$
For nets: $F + V = E + 1$

Example: Euler's Theorem

<table>
<thead>
<tr>
<th>Faces</th>
<th>Vertices</th>
<th>Edges</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>16</td>
<td>24</td>
</tr>
</tbody>
</table>

For nets:

<table>
<thead>
<tr>
<th>Faces</th>
<th>Vertices</th>
<th>Edges</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>16</td>
<td>25</td>
</tr>
</tbody>
</table>

Using your triangular prism
• Verify Euler’s formula
• Draw a net for the figure and verify Euler’s formula for the 2-D figure

Think of a cube…
• Verify Euler’s formula
• Draw a net for the figure and verify Euler’s formula for the 2-D figure

11-1 Assignment:
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Page 632 # 17, 24, 40
Quiz Friday!!