Geometry **9.1: Solid Figures** Name:_____

Students will be able to identify and name solid figures.

☆**Solids:** 3-dimensional shapes (3-D)

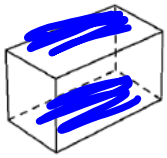
☆**Polyhedra:** solid formed by polygons

How do we name polyhedra? Use the shape of the BASE

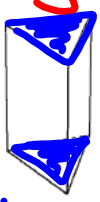
2 types of polyhedra are prisms and pyramids.

➢ *Shade in base, then use the shape of the base to name the prism/pyramid.*

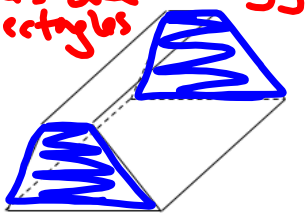
Prisms: 2 bases are congruent polygons
* remaining sides are rectangles



rectangular prism



triangular prism



trapezoidal prism

Pyramids: 1 base
* remaining sides are triangles

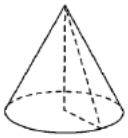
* Sides all meet at one vertex at top

rectangular pyramid

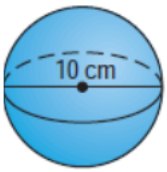
triangular pyramid

Not Polyhedra:

cylinder



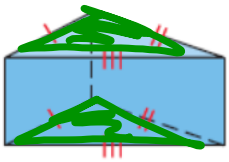
cone



sphere

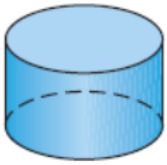
Example 1: Tell whether the solid is a polyhedron. If so, identify the shape of the bases. Then name the solid.

a.



yes, polyhedron
triangular prism

b.

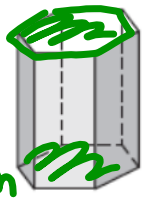


No, not a polyhedron
cylinder

c.

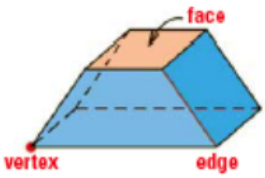
yes, polyhedron
rectangular prism

d.



yes
hexagonal prism

Parts of a Polyhedron:



plane surfaces called faces

segments joining the vertices are edges.

Euler's Formula:
The number of faces (F), vertices (V), and edges (E), of a polyhedron are related by the formula:

$F + V = E + 2$

Faces + Vertices = Edges + 2

Example 2: Use Euler's formula to find the missing value.

a. Faces:?
Vertices: 8
Edges: 12

$F + V = E + 2$
$F + 8 = 12 + 2$
$F + 8 = 14$
$-8 \quad -8$
$F = 6$

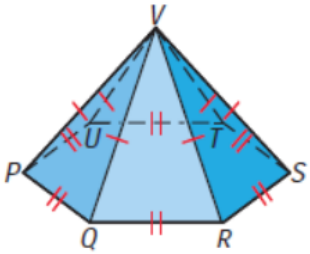
b. Faces: 5
Vertices: 6
Edges: ?

$F + V = E + 2$
$5 + 6 = E + 2$
$11 = E + 2$
$-2 \quad -2$
$9 = E$

c. Faces: 8
Vertices: ?
Edges: 18

$F + V = E + 2$
$8 + V = 18 + 2$
$8 + V = 20$
$-8 \quad -8$
$V = 12$

Example 3: Use the diagram at the right.



a. Name the polyhedron. hexagonal pyramid

b. Count the number of faces and edges.

Faces = 6 sides + 1 Base

c. List any congruent faces and congruent edges

Faces

$\triangle PVQ \cong \triangle QVR \cong \triangle RVS \cong$

$\triangle SVT \cong \triangle TVU \cong \triangle UVP$

Edges

6 base edges + 6 side edges

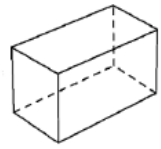
12 edges

Edges

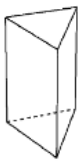
Base Edges: $\overline{PQ} \cong \overline{QR} \cong \overline{RS} \cong \overline{ST} \cong \overline{TU} \cong \overline{UP}$

side edges: $\overline{PV} \cong \overline{QV} \cong \overline{RV} \cong \overline{SV} \cong \overline{TV} \cong \overline{UV}$

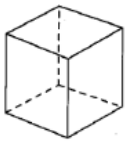
Types of Solids: Classify the groups of solids as prisms or pyramids. Then name the solid.



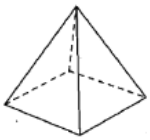
rectangular prism



triangular prism



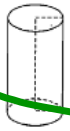
square prism (cube)



square/rectangular pyramid

triangular pyramid

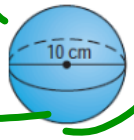
Cylinder



Cone

NOT polyhedron

Sphere



Homework: pg. 476: #11-37 odd, 56-61 all