Math 6/7 Winter Break Assignment

Hi Everyone!

I have broken down the winter break assignment into four mini lessons and one project. The first page of the assignment is vocabulary. As you read through each lesson, there will be new vocabulary. Be sure to write down the definitions! Each lesson starts with a guiding question that you will have to go back and answer at the end of each lesson. There are examples and practice problems for each lesson that you must complete. Finally, the mini project will apply all the skills taught over break.

Below is a suggested schedule to follow, to ensure you do not fall behind in your work:

November 30th - December 4th
Lesson 1

December 7th - December 11th
Lesson 2

December 14th - December 18th
Lesson 3

December 21st - January 1st
Lesson 4/Begin Mini Project
(Don't work on the holidays!!)

January 4th - January 8th
Mini project

DUE JANUARY 12TH

I will be logging on every Monday from November 30th to January 4th from 9:00-9:30 a.m. to provide extra help for math. Please take advantage of this, if you need the assistance. I want you to do well on this assignment so email me whenever you need help.

I hope you have some fun this break!!!

Mrs. Fernandez

Math 6/7 Winter Break Assignment

Vocabulary

Define the following terms.

1. Lateral face -

_____

2. Lateral area -

_____

3. Net -

_____

4. Polyhedrons/solid figure -

_____

5. Surface area -

_____

6. Volume -

_____

7. Area -

_____

8. Base (of a solid figure) -

_____

9. Vertex - (of a solid figure) -

_____

10. Edge (of a solid figure) -

_____

Lesson 1

Three Dimensional Figures and Nets

Guiding Question: How do you use nets to represent three-dimensional figures?

_____

_____

Polyhedrons or **Solid figures** have three dimensions - length, width, and height. They can be named by the shape of their **bases** (a flat surface of solid figure by which the figure is measured or classified; usually two of them) and the shapes of their **lateral faces** (the "walls" of solid figures). The **edges** of a polyhedron are the line where two faces meet, and the **vertices** are the points or corners of the shape.

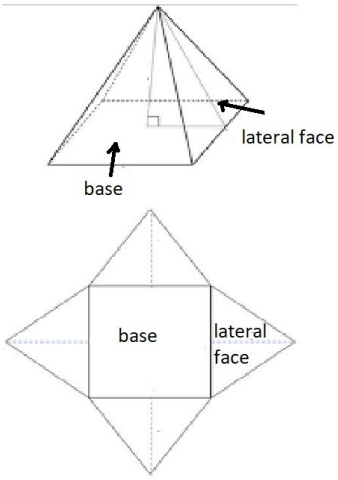
Identify and draw a net for the solid figure.

Step 1: Describe the base of the figure. The base is a square.

Step 2: Describe the lateral surfaces. The lateral surfaces are all congruent triangles.

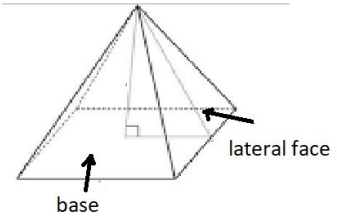
So, the figure is a <u>square pyramid.</u>

Step 3: Name the shapes to be used in the **net**. The net of a shape is when you unfold a solid figure into a polygon (two-dimensional shape). Then make a sketch. Draw a square for the base, and four triangles for the lateral faces.

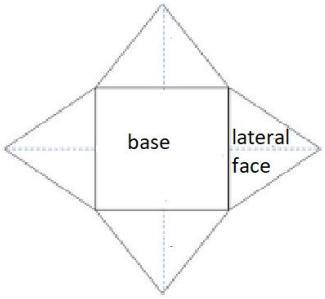


Identify and draw a net for the solid figure.

1.



<u>Draw the net.</u>



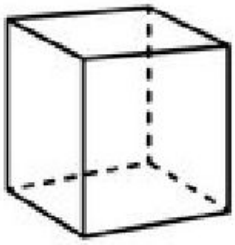
base: **<u>square</u>**

lateral faces: **<u>triangles</u>**

figure: **<u>square pyramid</u>**

edges: **<u>8</u>**

2.



<u>Draw the net.</u>

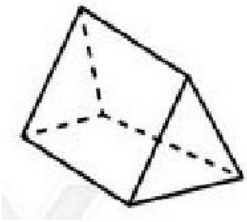
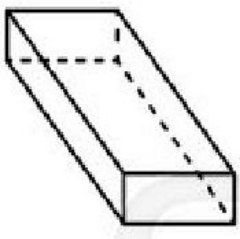
base: _____

lateral faces: _____

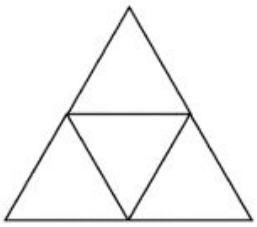
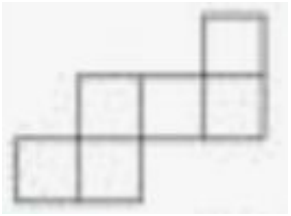
figure: _____

edges: _____

vertices : _____

vertices : **5**	
3. Draw the net.  base: _____ lateral faces: _____ figure: _____ edges: _____ vertices : _____	4. Draw the net.  base: _____ lateral faces: _____ figure: _____ edges: _____ vertices : _____

Identify and sketch the solid figure that can be formed by the net drawing.

1. Draw the solid.  Figure: _____	2. Draw the solid.  Figure: _____

Lesson 2

Explore Surface Area Using Nets

Guiding Question: How do you use nets to represent three-dimensional figures?

_____

_____

The net of a solid figure shows you all of the faces or surfaces of the figure. A net can help you find out the **surface area** of a figure. The surface area is the sum of the area of each face of a solid figure.

Find the surface area of a prism.

Step 1: Make a net of the rectangular prism. The prism has six rectangular faces, so the net drawing has six rectangles.

Step 2: Label each of the faces to better keep track of the area of each of the faces.

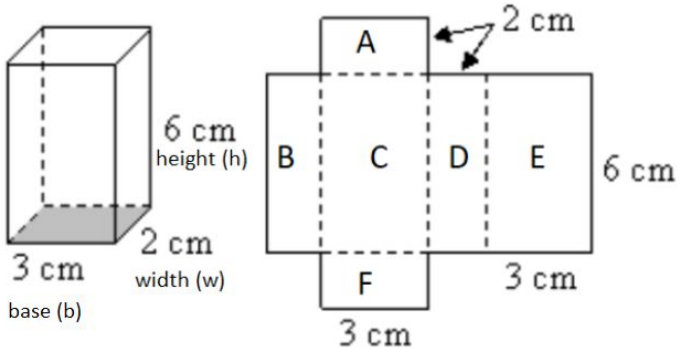
Step 3: Find the area of each face using the area formula.

Step 4: Add the areas of all the rectangular faces.

So, the surface area of the rectangular prism is 72 cm^2.

What are the congruent faces?

A is congruent to F; B is congruent to D; C is congruent to E



Area A =	B x W =	3 x 2 =	6
Area B =	W x H =	2 x 6 =	12
Area C =	B x H =	3 x 6 =	18
Area D =	W x H =	2 x 6 =	12
Area E =	B x H =	3 x 6 =	18
Area F =	B x W =	3 x 2 =	+ 6
Total surface area			72

The formula for surface area of a rectangular prism can be represented as:

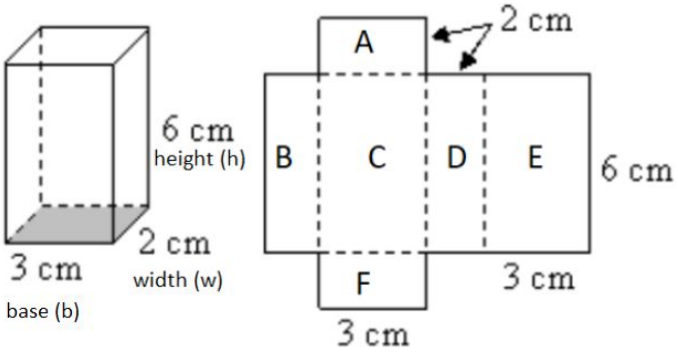
$$SA = 2 [(B \times W) + (W \times H) + (B \times H)]$$

The formula for surface area of a rectangular prism can be represented as:

$$SA = [2 (\frac{1}{2} \times B \times H)] + [3(B \times W)]$$

** Some formulas may be modified. **

Find the surface area of the prisms. SHOW ALL WORK!

<table>
<tr>
<td>1.
<u>Draw the net.</u>
 
</td>
<td>SA = 2 [(B x W) + (W x H) + (B x H)]
SA = 2 [(3 x 2) + (2 x 6) + (3 x 6)
SA = 2 [(6) + (12) + (18)]
SA = 2 [36]
SA = 72 cm^2</td>
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 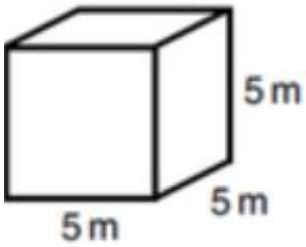
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 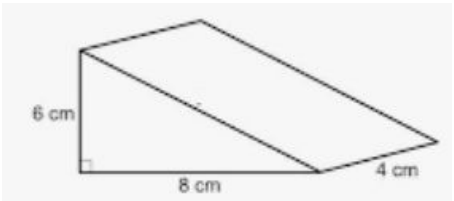
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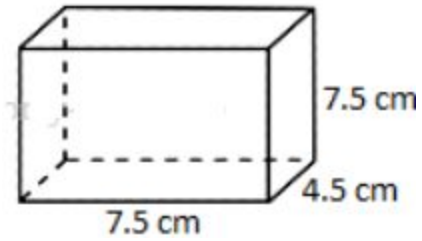

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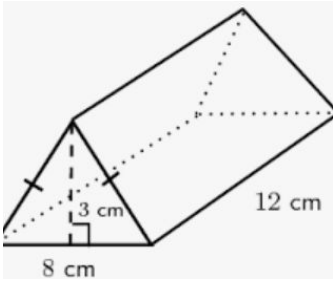

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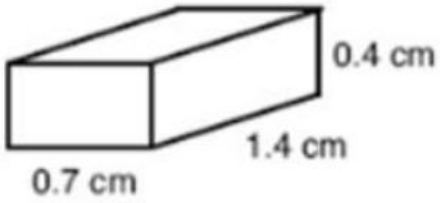


Lesson 3

Surface Area of Pyramids

Guiding Question: How can you find the surface area of a pyramid?

_____

_____

To find the surface area of a pyramid, add the area of the base to the **lateral area**. The lateral area is the combined area of the triangular faces.

Find the surface area of a pyramid.

Step 1: Make a net of the pyramid. The pyramid has four lateral faces if it has a square base. The pyramid has three lateral faces if it has a triangular base.

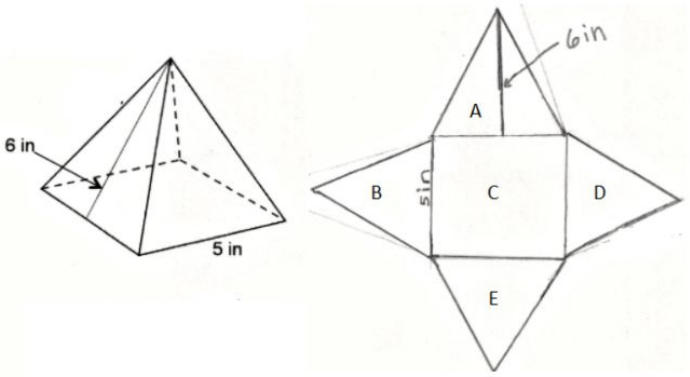
Step 2: The base is a square, so you need to use Area C = L x W to find the area of the base.

Step 3: Find the area of the lateral faces by using the area formula for triangles A= $\frac{1}{2}$ x B x W.

Step 4: Add the areas of all faces.

So, the surface area of the square pyramid is 85 in^2. What are the congruent faces?

A is congruent to B, D, and E



Area A= $\frac{1}{2}$ x B x H = $\frac{1}{2}$ x 5 x 6 = $\frac{1}{2}$ x 30 = 15

Area B= $\frac{1}{2}$ x B x H = $\frac{1}{2}$ x 5 x 6 = $\frac{1}{2}$ x 30 = 15

Area C = L x W = 5 x 5 = 25

Area D= $\frac{1}{2}$ x B x H = $\frac{1}{2}$ x 5 x 6 = $\frac{1}{2}$ x 30 = 15

Area E= $\frac{1}{2}$ x B x H = $\frac{1}{2}$ x 5 x 6 = $\frac{1}{2}$ x 30 = + 15

Total Surface Area 85

The formula for surface area of a square pyramid can be represented as:

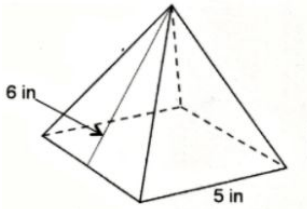
$$SA = [4(\frac{1}{2} \times B \times H)] + (B \times H)$$

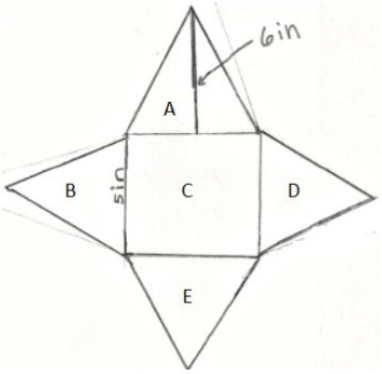
The formula for surface area of a triangular pyramid can be represented as:

$$SA = [3(\frac{1}{2} \times B \times H)] + (\frac{1}{2} \times B \times H)$$

Find the surface area of the pyramids. SHOW ALL WORK!

1. <u>Draw the net.</u>





SA = [4 ($\frac{1}{2}$ x B x H)] + (B x H)

SA = [4 ($\frac{1}{2}$ x 5 x 6)] + (5 x 6)

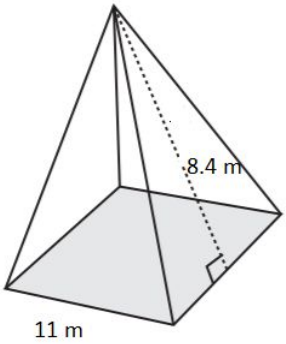
SA = [4 ($\frac{1}{2}$ x 30)] + (30)

SA = [4 (15)] + (30)

SA = 60 + 30

SA = 90 in^2

2.



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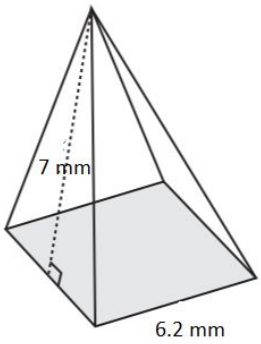

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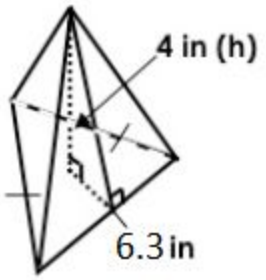

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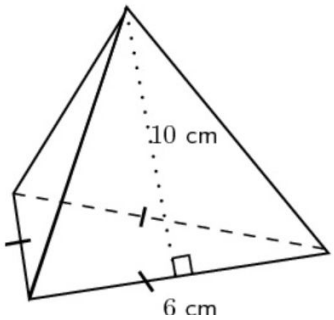

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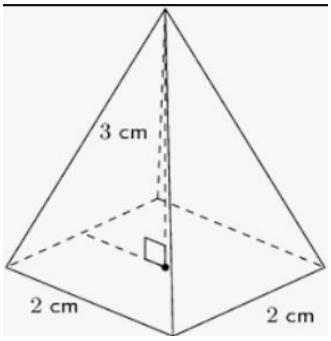


Lesson 4

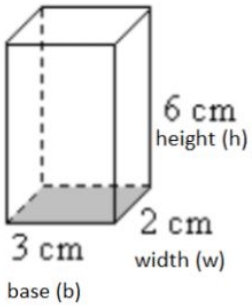
Volume of Rectangular Prisms and Triangular Prisms

Guiding question: How can you find the volume of a prism?

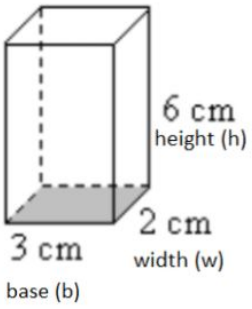
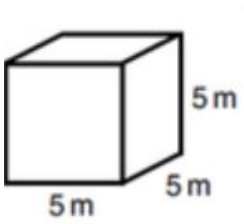
_____

_____

Volume is the number of units needed to occupy a given space without gaps or overlaps. You can find the volume of a prism by seeing how many units it takes to fill it up. You can easily find the volume when you have the length, width, and height of the prism.

Find the volume of a prism. *Step 1:* Decide whether the prism is rectangular or triangular. Then identify the length, width, and height of the prism. *Step 2:* If the prism is rectangular, use the formula v = B x W x H. If the prism is triangular, use the formula v = $\frac{1}{2}$ x B x H *Step 3:* Plug the numbers into the formula and solve. So, the volume of the rectangular prism is 36 cm^3 .	 V = B x W x H V = 3 x 2 x 6 V = 36 cm^3

Find the volume of the prisms. SHOW ALL WORK!

7.  V = B x W x H V = 3 x 2 x 6 V = 36 cm^3	8. 

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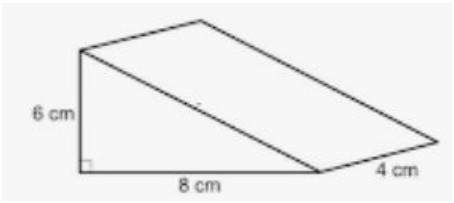

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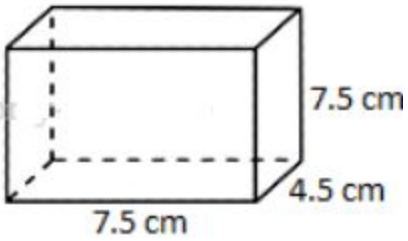

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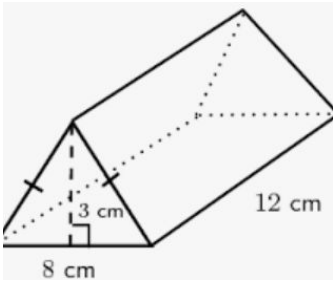

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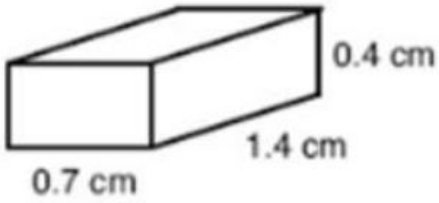

Mini Project

Throughout the winter break, you have been learning about solid shapes. It's now time for you to apply all that you have learned in one cohesive project. You have been given five solid shapes. For each shape you must do the following:

1. Cut on the outside of the net shape of the solid shape.
2. Fold it along the lines to create the solid shape.
3. Label each face. The example has A - F.
4. Measure each of the faces height and base using the centimeters side of the ruler.
5. On five of the faces write the following:
    a. The amount of faces and congruent faces
    b. The amount of edges and vertices
    c. One other net shapes that can be decomposed and rearranged
    d. A sketch of the solid shape
    e. The surface area and volume (you are not doing the volume of the pyramids!)
6. Glue each solid shape on colorful paper by the base and label the solid shape.
7. Glue all five solid shapes on a poster board.
8. SHOW ALL WORK ON THE SIDE LIKE THE EXAMPLE!
9. Make sure your work is neat and colorful!