

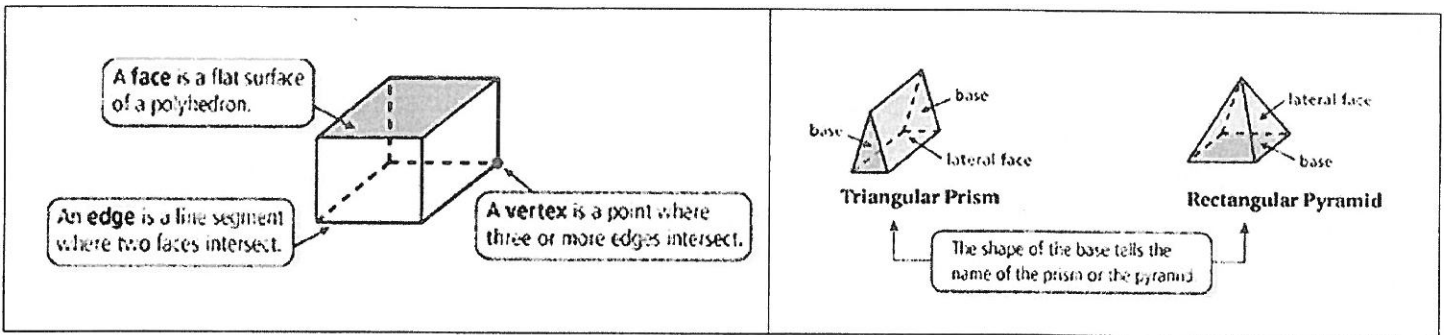
Section 8.1: Three-Dimensional Figures

Objective: Students will be able to identify three-dimensional shapes and find the number of faces, edges and vertices that are in the shape.

Essential Question: How can you draw three-dimensional figures?


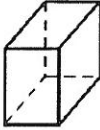
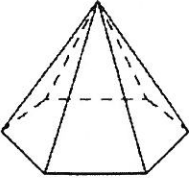
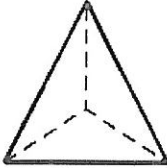
Vocabulary:

- 1.) Space Figure - a three-dimensional figure or solid
- 2.) Prism - a space figure with two polygon bases and lateral faces that are parallelograms
- 3.) Pyramid - a space figure with one polygon base and triangular faces that meet at a vertex



Examples:

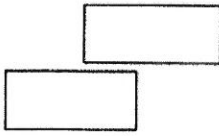
Describe the base, name the figure, number of vertices, faces, and edges.

<p>1.)</p>  <p>Base = pentagon</p> <p>Figure = pentagonal prism</p> <p>Vertices: 10 Faces: 7 Edges: 15</p>	<p>2.)</p>  <p>Base = rectangle</p> <p>Figure = rectangular prism</p> <p>Vertices: 8 Faces: 6 Edges: 12</p>
<p>3.)</p>  <p>Base = hexagon</p> <p>Figure = hexagonal pyramid</p> <p>Vertices: 7 Faces: 7 Edges: 12</p>	<p>4.)</p>  <p>Base = triangle</p> <p>Figure = triangular pyramid</p> <p>Vertices: 4 Faces: 4 Edges: 6</p>

5.) Draw a rectangular prism.

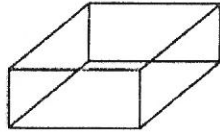
Step 1:

Draw identical rectangular bases.



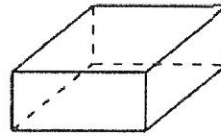
Step 2:

Connect corresponding vertices.



Step 3:

Change any *hidden* lines to dashed lines.



6.) Draw a triangular pyramid.

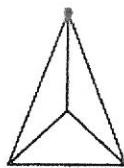
Step 1:

Draw a triangular base and a point.



Step 2:

Connect the vertices of the triangle to the point.

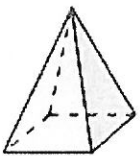


Step 3:

Change any *hidden* lines to dashed lines.



7.) Draw the front, side, and top views of the solid.



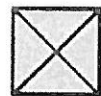
front:



side:



top:



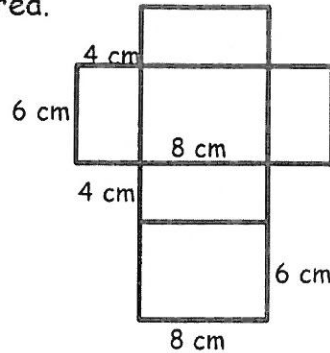
Section 8.2: Surface Area of Prisms

Objective: Students will be able to find the surface area of a prism from a net.

Essential Question: How can you find the area of the entire surface of a prism?

1.) Find the surface area.

Figure:
Rectangular
Prism



Surface Area:

Sides: $4(6) = 24 \cdot 2 = 48$

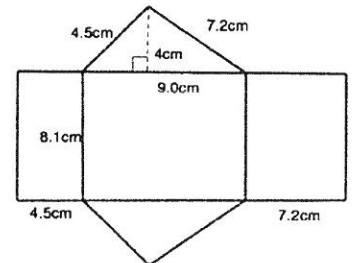
Large Rectangles: $8(6) = 48 \cdot 2 = 96$

Small Rectangles: $8(4) = 32 \cdot 2 = 64$

$48 + 96 + 64 = 208 \text{ cm}^2$

2.) Find the surface area.

Figure:
Triangular
Prism



Surface Area:

Triangles:

$0.5(4)(9) = 18 \cdot 2 = 36$

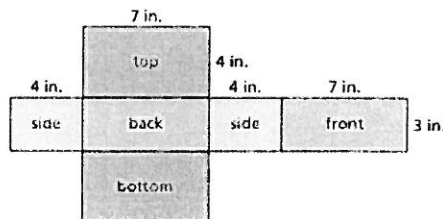
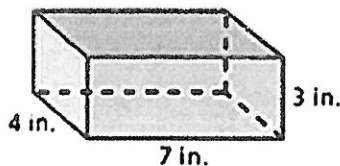
Left Rectangle = $8.1(4.5) = 36.45$

Middle Rectangle = $8.1(9) = 72.9$

Right Rectangle = $8.1(7.2) = 58.32$

$36 + 36.45 + 72.9 + 58.32 = 203.67 \text{ cm}^2$

3.) Make a net of the rectangular prism. Then find the surface area.



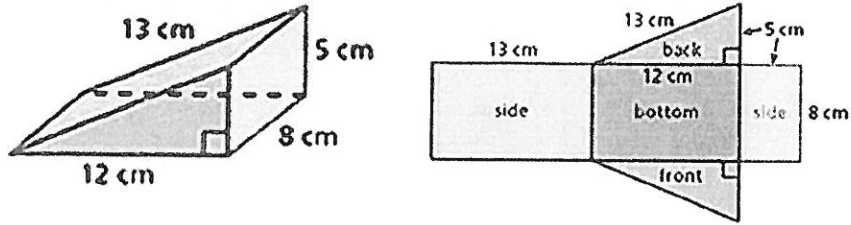
Top/Bottom: $7(4) = 28 \cdot 2 = 56$

Sides: $4(3) = 12 \cdot 2 = 24$

Front/Back: $7(3) = 21 \cdot 2 = 42$

$56 + 24 + 42 = 122 \text{ in}^2$

4.) Make a net of the triangular prism. Then find the surface area.



Triangles: $0.5(5)(12) = 30 \cdot 2 = 60$

Left Rectangle: $13(8) = 104$

Middle Rectangle: $12(8) = 96$

Right Rectangle: $5(8) = 40$

Total = $60 + 104 + 96 + 40 = 300 \text{ cm}^2$

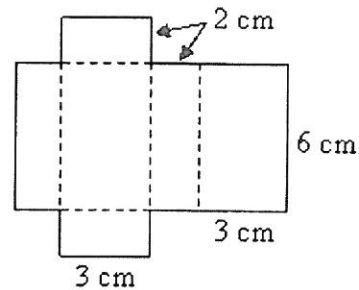
5.) A rectangular prism that is 3 cm long, 2 cm wide, and has a height of 6 cm. Draw a net for the rectangular prism, then find the surface area.

Bottom/Top: $3(2) \cdot 2 = 12$

Sides: $2(6) \cdot 2 = 24$

Front/Back: $6(3) \cdot 2 = 36$

Total = $12 + 24 + 36 = 72 \text{ cm}^2$



Section 8.3: Surface Areas of Pyramids

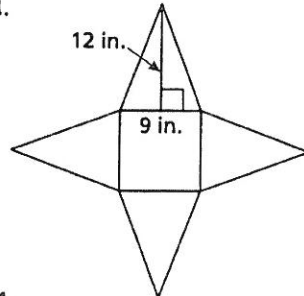
Objective: Students will be able to find the surface area of a pyramid from a net.

Essential Question: How can you use a net to find the surface area of a pyramid?

1.) Find the surface area.

Figure:

Square Pyramid



Surface Area:

Base: $9(9) = 81$

1 Triangle: $0.5(9)(12) = 54$

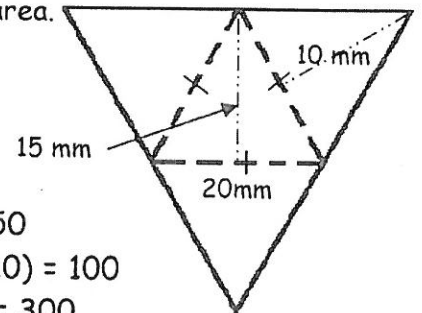
4 Triangles: $4(54) = 216$

$81 + 216 = 297\text{in}^2$

2.) Find the surface area.

Figure:

Triangular Pyramid



Surface Area:

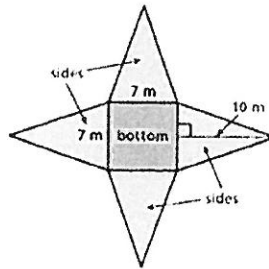
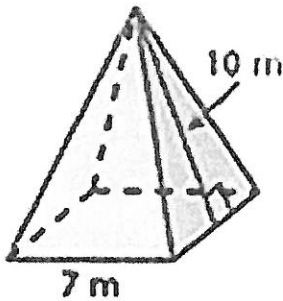
Base: $0.5(15)(20) = 150$

1 Triangle: $0.5(20)(10) = 100$

3 Triangles: $3(100) = 300$

$150 + 300 = 450\text{ mm}^2$

3.) Draw a net for the square pyramid. Then find the surface area.



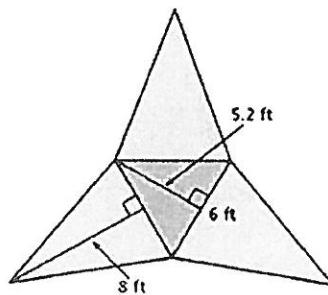
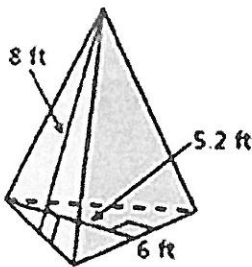
Base: $7(7) = 49$

1 Triangle: $0.5(7)(10) = 35$

4 Triangles: $4(35) = 140$

Total: $49 + 140 = 189\text{ m}^2$

4.) Draw a net for the triangular pyramid. Then find the surface area.



Base: $0.5(6)(5.2) = 15.6$

1 Triangle: $0.5(6)(8) = 24$

3 Triangles: $3(24) = 72$

Total: $15.6 + 72 = 87.6\text{ ft}^2$

Section 8.4: Volumes of Rectangular Prisms

Objective: Students will be able to find the volume of prisms and unknown dimensions of a prism using the volume.

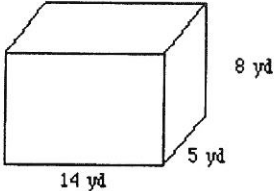
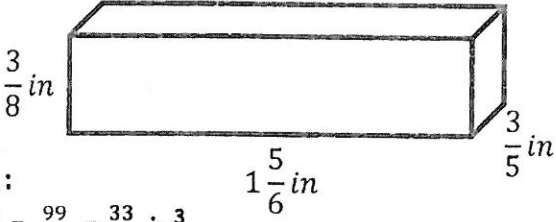
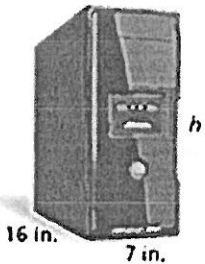
Essential Question: How can you find the volume of a rectangular prism with fractional edge lengths?

Volume Formulas:

$V = Bh$

 where "B" is the area of the base and "h" is the height

Find the volume of each figure.

<p>1.)</p> <div style="text-align: center;">  </div> <p>Volume: $14 \cdot 5 \cdot 8 = 560\text{yd}^3$</p>	<p>2.)</p> <div style="text-align: center;">  </div> <p>Volume: $\frac{3}{8} \cdot \frac{11}{6} \cdot \frac{3}{5} = \frac{99}{240} = \frac{33}{80} \text{ in}^3$</p>
<p>3.) If the volume of a rectangular prism is 336in^3, the base is 12in, and the width is 7in, what is the height?</p> <p> $336 = h \cdot 12 \cdot 7$ $336 = b \cdot \cancel{84}$ $84 \quad \cancel{84}$ $b = 4\text{in}$ </p>	<p>4.) Write and solve an equation to find the height of the computer tower.</p> <div style="text-align: center;">  </div> <p> $1792 = h \cdot 16 \cdot 7$ $1792 = b \cdot \cancel{112}$ $112 \quad \cancel{112}$ $b = 16 \text{ in.}$ </p> <p style="text-align: center;">Volume = 1792 in.^3</p>