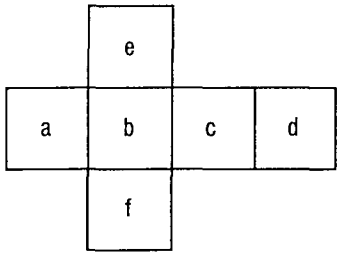
Name _____

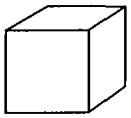
8.2 Surface Areas of Polyhedra

MATHPOWER™ *Eight*, pp. 248–249

The **surface area** of a figure is the sum of the areas of all its faces.

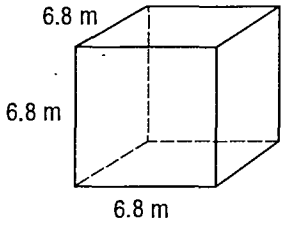
surface area = areas of a + b + c + d + e + f





Draw the net. Then, estimate and calculate the surface area of each polyhedron.

1.



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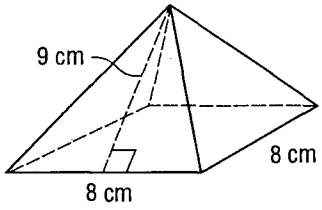
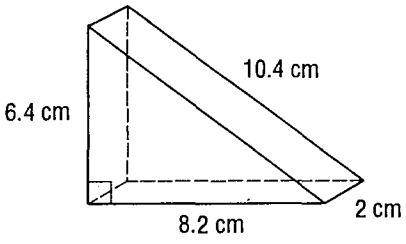
2.



_____

3.



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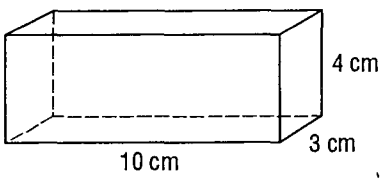
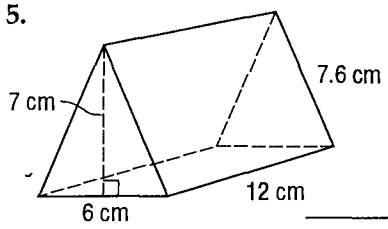
4.



_____

Calculate the surface area.

5.



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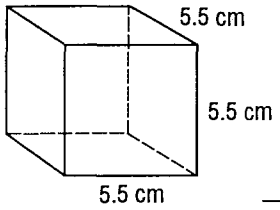
6.



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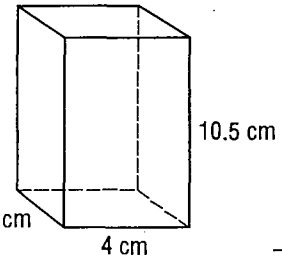
7.

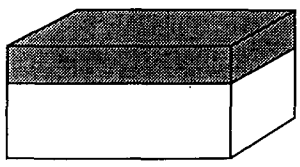


_____

8. A box of facial tissues is 22 cm by 10.5 cm by 8 cm. How much cardboard is on the outside surface?

_____

9. A storage box is 60 cm long, 45 cm wide, and 30 cm high. The lid is 10 cm high. What is the surface area of the box and its lid?



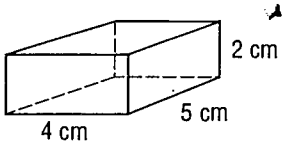
_____

Name _____

8.3 Volumes of Prisms

MATHPOWER™ *Eight*, pp. 252–253

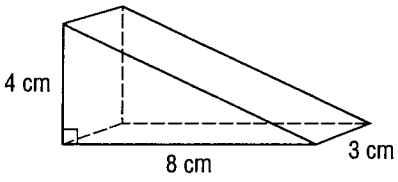
The **volume of a prism** is the area of the base multiplied by the height of the prism.



Area of base $4 \times 5 = 20$

Volume $20 \times 2 = 40$

The volume is 40 cm^3.



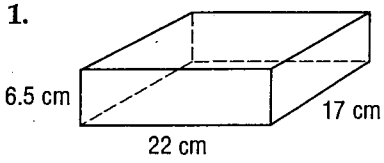
Area of base $\frac{1}{2} \times 4 \times 8 = 16$

Volume $16 \times 3 = 48$

The volume is 48 cm^3.

Estimate, then calculate the volume of each prism.

1.



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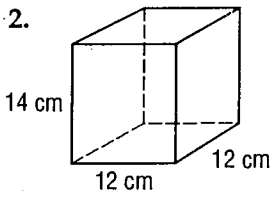
2.



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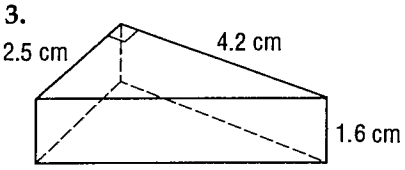
3.



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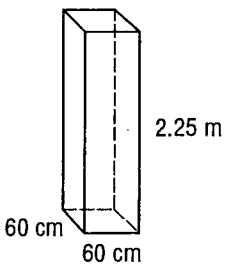
4.



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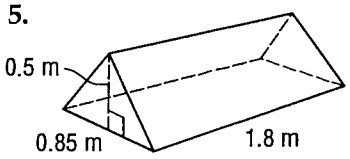
5.



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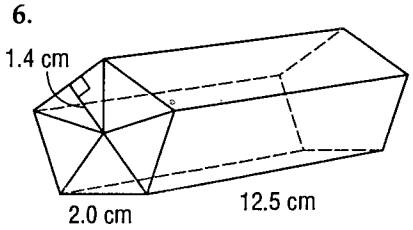
Find the volume of each prism with a regular polygon as its base.

6.



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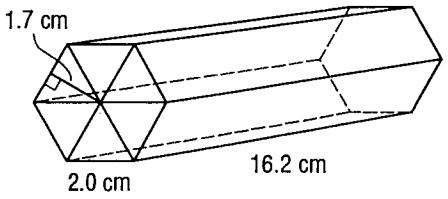
7.



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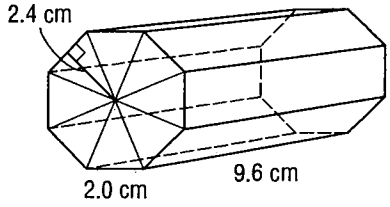
8.



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9. a) An aquarium is filled to 3 cm from the top. How much water is in the aquarium if it is 75 cm long, 42 cm wide, and 48 cm high?

_____

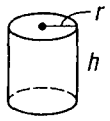
b) What is the total volume of the aquarium?

_____

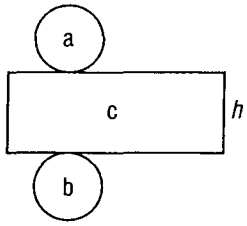
Name _____

8.4 Surface Area and Volume of a Cylinder

MATHPOWER™ *Eight*, pp. 254–255



Volume = area of base × height
$= \pi r^2 \times h$

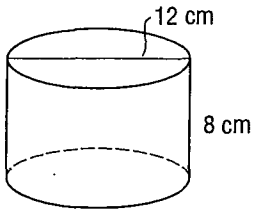


Surface area = areas of a + b + c
$= \pi r^2 + \pi r^2 + (\pi d \times h)$

Use $\pi = 3.14$.

Calculate the surface area and the volume of each cylinder.

1.



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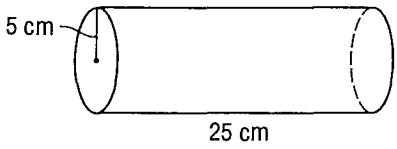
2.



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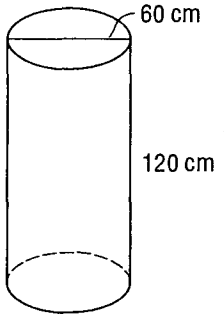
3.



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_____

4. A flour canister is 25 cm tall and has a diameter of 20 cm. It is filled to 3 cm from the top. What volume of flour does it contain?

_____

5. A juice can is 16 cm tall and has a diameter of 9 cm. The ends of the can are tin and the body is cardboard.

a) What is the volume of the can?

_____

b) What area of tin is used?

_____

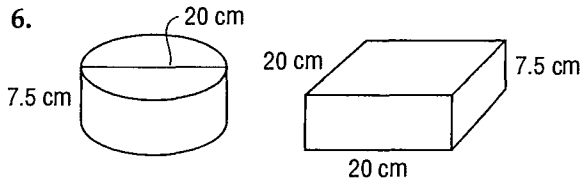
c) What area of cardboard is used?

_____

d) What is the total surface area?

_____

6.



a) Which shape has the greater surface area?

_____

b) By how much is it greater?

_____

c) Which shape has the greater volume?

_____

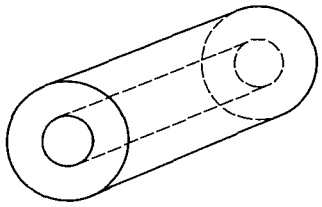
d) By how much is it greater?

_____

Name _____

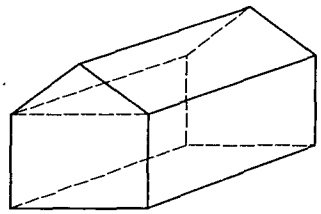
8.5 Surface Area and Volume of Composite Solids

MATHPOWER™ *Eight*, pp. 262–263



Volume = volume of large cylinder – volume of small cylinder

Surface area = area of large cylinder's curved face
+ area of small cylinder's curved face
+ area of large cylinder's circular faces
− area of small cylinder's circular faces

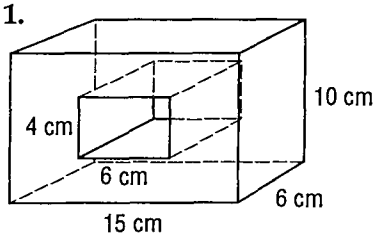


Volume = volume of rectangular prism
+ volume of triangular prism

Surface area = area of 5 faces of rectangular prism
+ area of 4 faces of triangular prism

Find the volume.

1.



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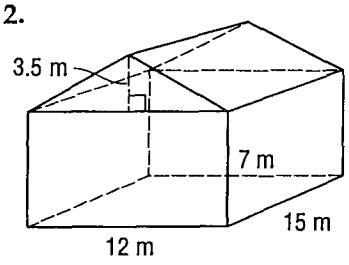
2.



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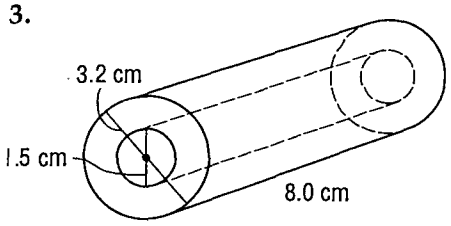
Find the surface area.

3.



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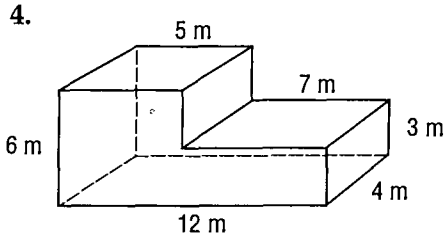
4.



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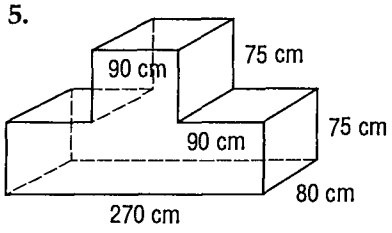
Find the surface area and the volume.

5.



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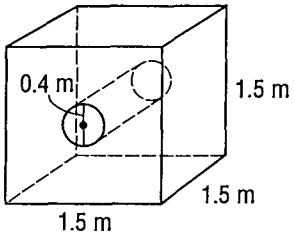
6.



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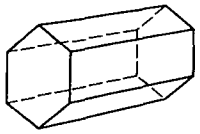
_____

Name _____

Test One CHAPTER 8: Surface Area and Volume

MATHPOWER™ *Eight*, pp. 243–267

Name each polyhedron and state its number of faces, edges, and vertices.

1. 

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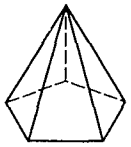
2. 

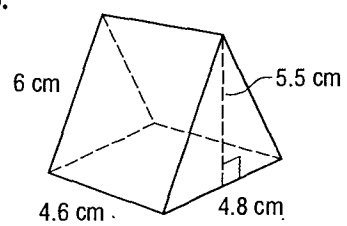
_____

Draw a net for each polyhedron.

3. rectangular prism

4. triangular pyramid

Estimate, then calculate the surface area.

5. 

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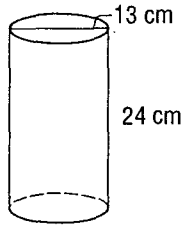
6. 

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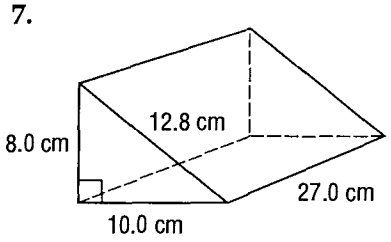
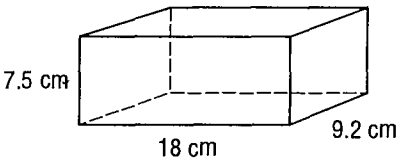
7. 

_____

Calculate the volume.

8. 

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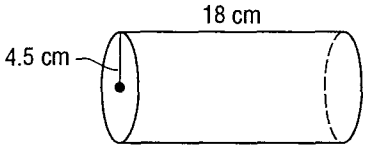
9. 

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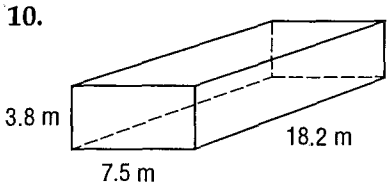
10. 

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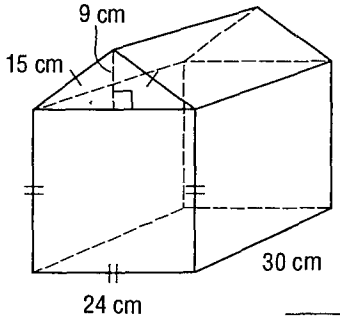
11. Calculate the surface area and the volume.



_____

_____

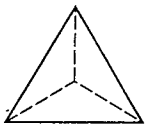
Name _____

Test Two CHAPTER 8: Surface Area and Volume

MATHPOWER™ *Eight*, pp. 243–267

Name each polyhedron and state its number of faces, edges, and vertices.

1.



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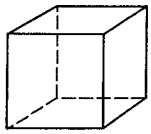
2.



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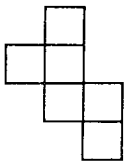
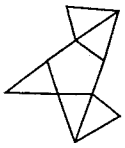
Name and sketch the polyhedron made from each net.

3.

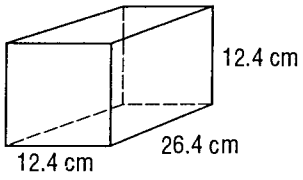


4.



Estimate, then calculate the surface area.

5.



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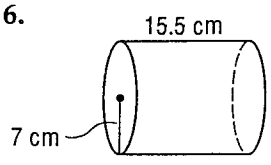
6.



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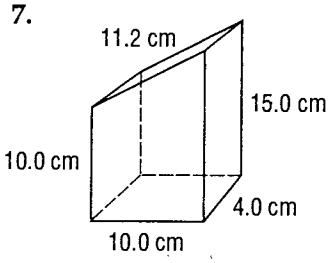
7.



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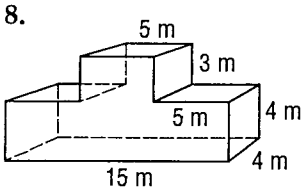
Calculate the volume.

8.



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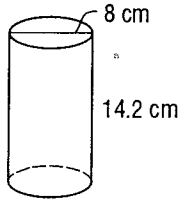
9.



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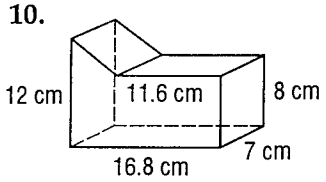
10.



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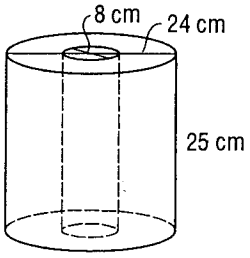
11. Calculate the surface area and the volume.



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_____

12. A container has the shape of a rectangular prism. Its inside dimensions are 10 cm by 8 cm by 14 cm. Find the volume of water, in cubic decimetres, the container holds.

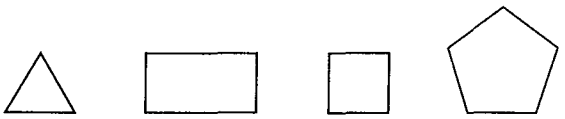
_____

Name _____

Extension CHAPTER 8: Surface Area and Volume

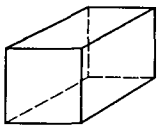
MATHPOWER™ *Eight*, pp. 243–267

Each of the shapes is worth the given value.



equilateral triangle	rectangle	square	regular pentagon
$1.50	$2.75	$3.00	$5.25

Calculate the cost of constructing each of the following solids.

1. 

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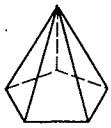
2. 

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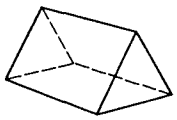
3. 

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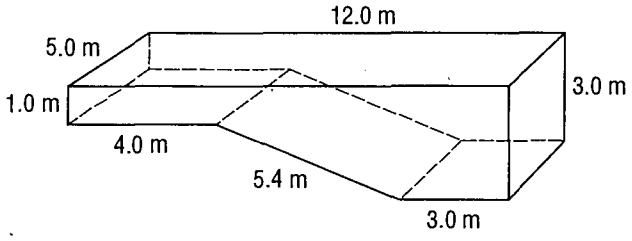
Use the dimensions of this swimming pool for questions 4 and 5.



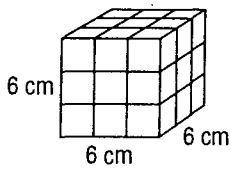
4. Calculate the volume of the pool.

_____

5. Calculate the surface area of the pool's liner.

_____

6. The outside surfaces of a cube are painted blue. The cube is cut into 27 congruent cubes.



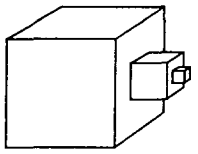
a) Calculate the surface area of the painted surfaces of the small cubes.

_____

b) Calculate the surface area of the unpainted surfaces of the small cubes.

_____

7. The side lengths of each cube in the diagram are 3 times longer than the cube to its right. The volume of the middle cube is 27 cm^3. What is the volume of the other 2 cubes?



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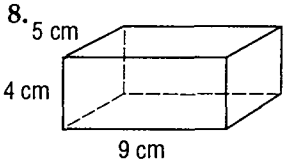
8. 

The dimensions of the rectangular prism are shown. Predict, then calculate the answer to each of the following.

a) What is the effect on the volume of the prism if the length is increased by 1 cm?

_____

b) What is the effect on the surface area of the prism if the length is increased by 1 cm?

_____

c) What is the effect on the volume of the prism if the width is increased by 1 cm?

_____

d) What is the effect on the surface area of the prism if the width is increased by 1 cm?

_____

e) What is the effect on the volume of the prism if the height is increased by 1 cm?

_____

f) What is the effect on the surface area of the prism if the height is increased by 1 cm?

_____