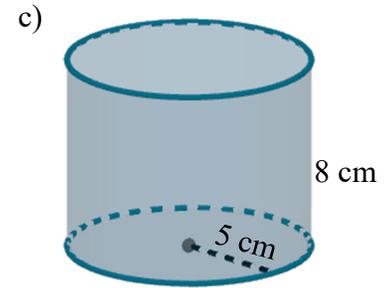
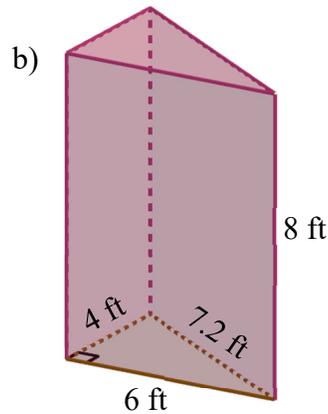
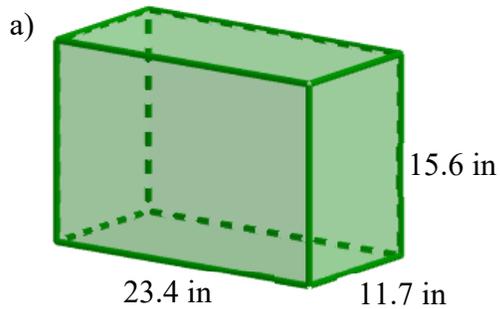


PART A

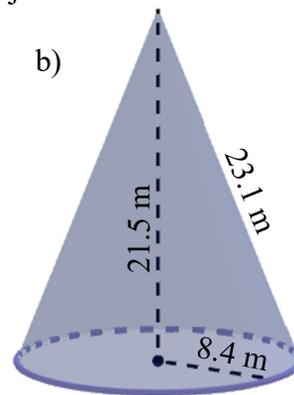
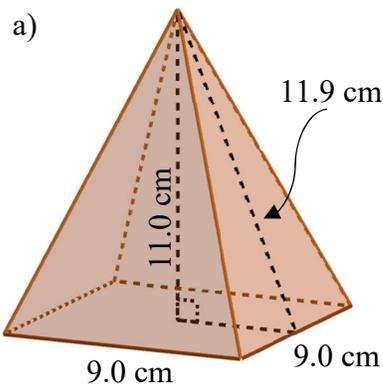
1) Determine the volume of each object.



2) Determine the surface area of each object in question #1.

3) Determine the volume and surface area of a cube that has edge lengths of 6.75 m.

4) Determine the volume and surface area of each object.



5) Determine the volume of a rectangular prism that has the same base shape and height as the pyramid shown in question #4(a).

6) Determine the circumference of the base of the cone shown in question #4(b).

PART B

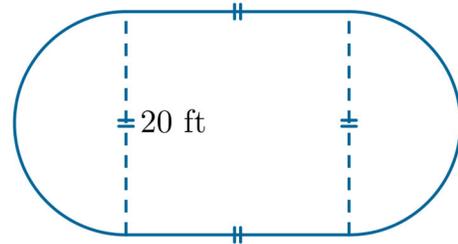
7) Determine the volume of an 11' × 14' room with an 8' ceiling.

8) A cylinder has a diameter of 3.4 inches and a height of 7.2 inches.

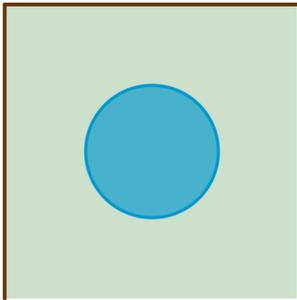
- a) Determine the volume of the cylinder.
- b) A cone has the same base shape and the same height as the cylinder. How many times greater is the volume of the cylinder than that of the cone?
- c) Determine the surface area of the cylinder.
- d) Find the area of the cylinder's lateral surface.

- 9) A triangle has a base of $2\frac{3}{8}$ inches and height of $3\frac{1}{4}$ inches.
- Determine the exact area of the triangle.
 - If the triangle is the base of a prism with length $5\frac{1}{2}$ inches, determine the exact volume of the prism.

- 10) A backyard ice rink consists of a rectangular middle section and semicircular ends, as shown in the diagram on the right.



- Determine the perimeter of the rink.
- Determine the area of the rink.
- If the ice has a thickness of 0.2 feet, determine the volume of ice used for the rink.



- 11) A circular pool with a radius of 9' is to be placed in the centre of a square backyard measuring $40' \times 40'$, as shown on the left. The remainder of the yard will be covered by grass.

- Determine the area of the yard covered by grass.
- Three sides of the yard will be fenced. If the homeowner can install fence at a cost of \$28 per linear foot, find the total cost of installing the fence.
- If the depth of the water in the pool is 4', calculate the volume of water in the pool.

- 12) A cylindrical soup can has a radius of 3 cm and a height of 10 cm Yindi is designing a new can that will hold more soup than the current design.

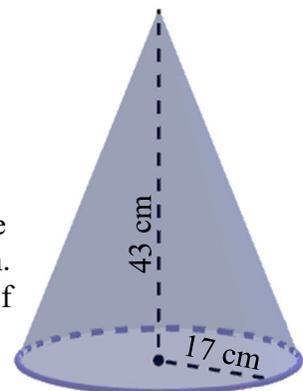


- Determine the volume of the current design.
- Determine the volume of the can if the radius of the original design is increased by 1 cm, but the height is not changed.
- Determine the volume of the can if the height of the original design is increased by 1 cm, but the radius is not changed.
- Explain why increasing the radius by 1 cm has a greater impact on the volume than increasing the height by 1 cm.

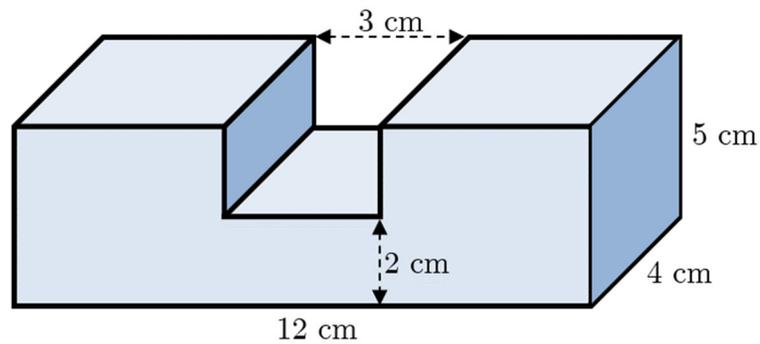
- 13) Find the surface area of the cone shown on the right.



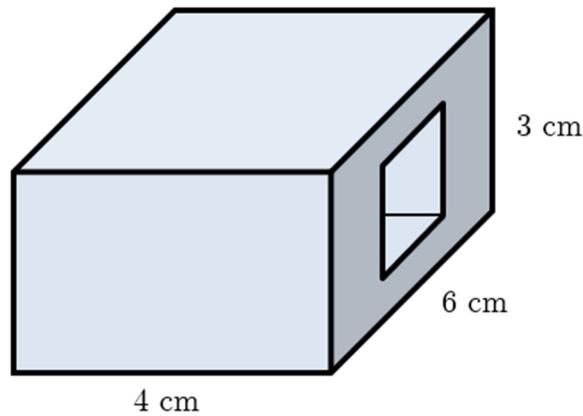
- 14) The entrance of the Louvre in Paris is a square-based pyramid with a height of 21.6 m. The side length of the square base is 35 m. Calculate the total surface area of the four triangular faces to the nearest square metre.



15) A building block is shown below. Determine the total volume of the block.

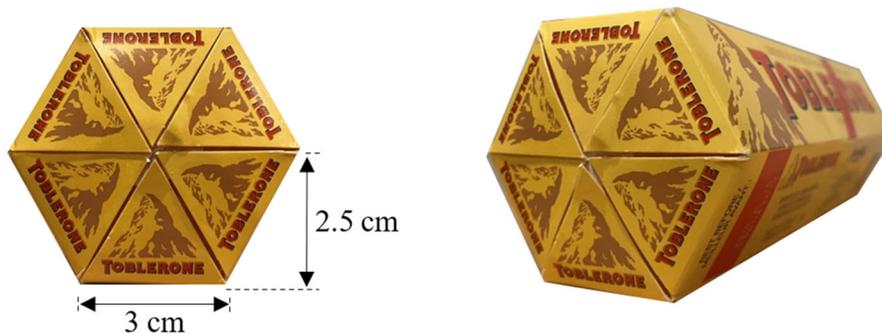


16) A solid rectangular prism has a section removed throughout its width, as shown below. If the face of the missing section is a square with side length 2 cm, determine the volume of the solid.



17) A box in the shape a hexagonal prism tightly holds six chocolate bars, each packaged in a triangular prism-shaped box, as shown below. The triangular face of each individual chocolate bar box has a base of 3 cm and a height of 2.5 cm. The length of the hexagonal box is 17 cm.

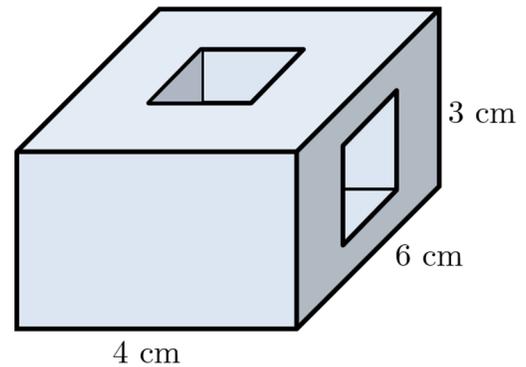
- Determine the area of the box's hexagonal face.
- Determine the volume of the hexagonal box.
- Determine the surface area of the hexagonal box.





- 18) A concrete mixing silo consists of cylindrical rings and a conical spout. Each cylindrical ring has a height of 122.5 cm and a diameter of 322.5 cm.
- How much volume, to the nearest tenth of a cubic metre, does each cylindrical ring add to the silo?
 - Determine, to the nearest tenth of a cubic metre, the volume of the conical spout if its height is 230 cm.
 - Determine the volume of a silo with 6 rings.
 - Write an equation to model the volume, V (in cubic metres), of a silo that has n rings.
 - If a silo must hold a volume of 110 m^3 , how many rings are needed?

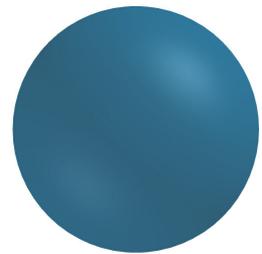
- 19) A solid rectangular prism has a hole cut through the centre of its top and an identical hole cut through the centre of its side, as shown on the right. These holes pass through to the opposite side of the box. If the face of each hole is a square with side length 2 cm, determine the volume of the solid.



- 20) An open-top cylindrical container has a radius of 5.5 cm and a height of 24 cm. Determine the surface area of the outside of the container to the nearest hundredth of a square centimetre.

- 21) For a sphere with radius r , the volume is given by $V = \frac{4}{3}\pi r^3$ and the surface area is given by $A = 4\pi r^2$.

- Calculate the volume of a sphere that has a diameter of 10 cm.
- Determine the surface area of a sphere with a radius of 14.2 mm.
- A sphere has a surface area of 3824 m^2 . Determine the volume of the sphere to the nearest hundredth of a cubic metre.



- 22) A pyramid and a rectangular prism have identical bases and the same volume. How do the heights of the two objects compare?
- 23) A cylinder and a cone have the same volume and height. If the radius of the cylinder is 5 cm, determine the radius of the cone to the nearest tenth of a centimetre.
- 24) The lateral surface of a cylinder has an area of 824 m^2 . The cylinder has a height of 40 m.
- Determine the circumference of the cylinder's circular face.
 - Determine the volume of the cylinder.

ANSWERS

- 1) a) 4271.0 in^3 b) 96 ft^3 c) 628.3 cm^3
- 2) a) 1642.7 in^2 b) 161.6 ft^2 c) 408.4 cm^2
- 3) volume $\approx 307.5 \text{ m}^3$, surface area $\approx 273.4 \text{ m}^2$
- 4) a) volume = 297 cm^3 , surface area = 295.2 cm^2
b) volume = 1588.6 m^3 , surface area = 831.3 m^2
- 5) 891 cm^3
- 6) 52.8 m
- 7) 1232 ft^3
- 8) a) 65.4 in^3 b) 3 c) 95.1 in^2 d) 76.9 in^2
- 9) a) $3\frac{55}{64} \text{ in}^2$ b) $21\frac{29}{128} \text{ in}^3$
- 10) a) 102.8 ft b) 714.2 ft^2 c) 142.8 ft^3
- 11) a) 1345.5 ft^2 b) $\$3360.00$ c) 1017.9 ft^3
- 12) a) 282.7 cm^3 b) 502.7 cm^3 c) 311.0 cm^3 d) Increasing the radius has a greater impact on the volume than increasing the height by the same amount because the radius value is squared in the calculation, whereas the height value is not.
- 13) 3377.4 cm^2
- 14) 1946 m^2
- 15) 204 cm^3
- 16) 56 cm^3
- 17) a) 22.5 cm^2 b) 382.5 cm^3 c) 351 cm^2
- 18) a) 10 m^3 b) 6.3 m^3 c) 66.3 m^3 d) $V = 10n + 6.3$ e) 11
- 19) 52 cm^3
- 20) 924.41 cm^2
- 21) a) 523.6 cm^3 b) 2533.9 mm^2 c) $22\,235.69 \text{ m}^3$
- 22) The height of the pyramid is 3 times the height of the rectangular prism.
- 23) 8.7 cm
- 24) a) 20.6 m b) 1350.8 m^3