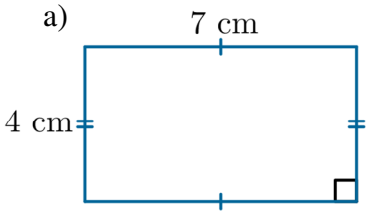
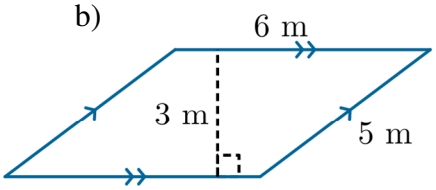
PART A

1) Determine the perimeter of each shape.

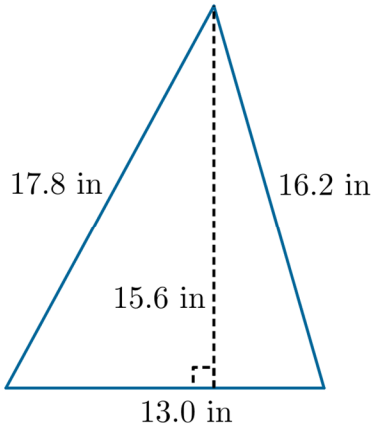
a)



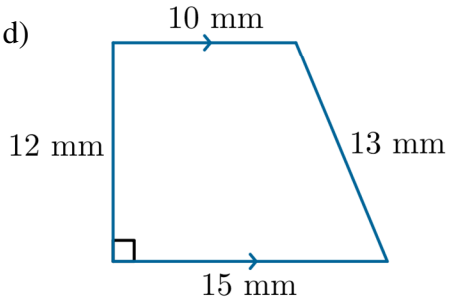
b)



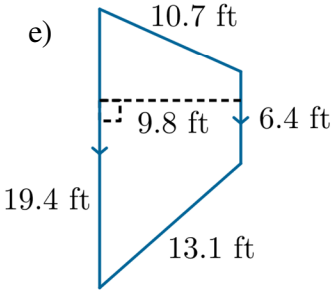
c)



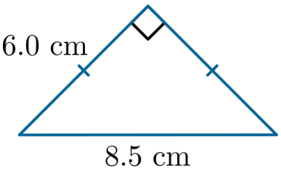
d)



e)

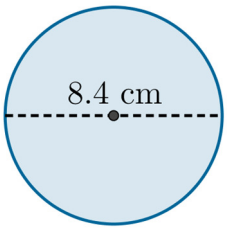


f)



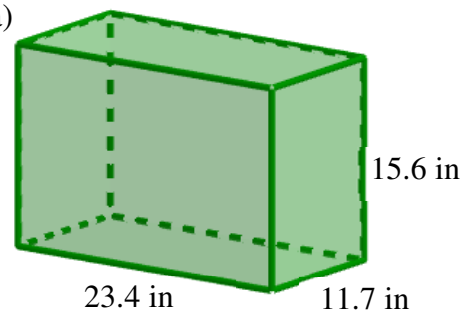
2) Determine the area of each shape in question #1.

3) Consider the circle shown on the right.
   a) Determine the circle's radius.
   b) Calculate the circumference of the circle.
   c) Find the area of the circle.

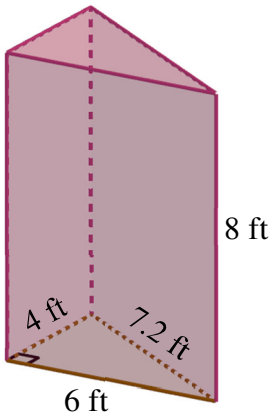


4) Determine the volume of each object.

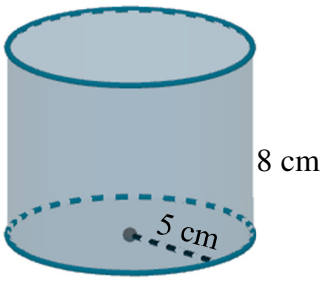
a)



b)



c)



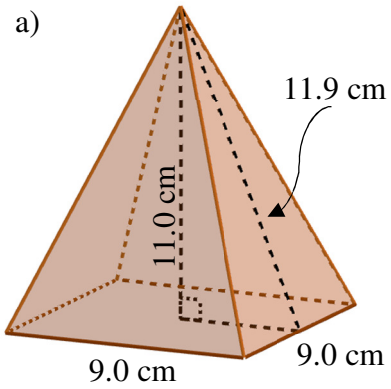
5) Determine the surface area of each object in question #4.

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

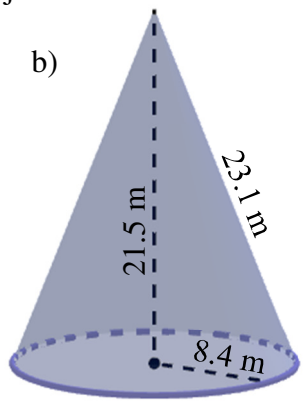
PART B

7) Determine the volume and surface are of each object.

a)



b)



8) Determine the volume of a rectangular prism that has the same base shape and height as the pyramid shown in question #7(a).

9) Determine the circumference of the base of the cone shown in question #7(b).

10) Determine the volume of an $11' \times 14'$ room with an $8'$ ceiling.

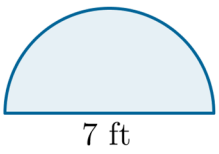
11) A cylinder has a diameter of 3.4 inches and a height of 7.2 inches.
   a) Determine the volume of the cylinder.
   b) A cone has the same base shape and the same height as the cylinder. How many times greater is the volume of the cylinder than that of the cone?
   c) Determine the surface area of the cylinder.
   d) Find the area of the cylinder's lateral surface.

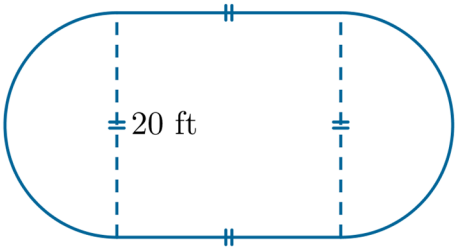
12) A triangle has a base of $2\frac{3}{8}$ inches and height of $3\frac{1}{4}$ inches.
   a) Determine the exact area of the triangle.
   b) If the triangle is the base of a prism with length $5\frac{1}{2}$ inches, determine the exact volume of the prism.

13) A rectangle has a length of 12.5 m and an area of 390 m^2. Determine the width of the rectangle.

14) A circle has an area of 3176.9 mm^2. Determine the circle's radius to the nearest tenth of a millimetre.

15) Determine the area and perimeter of the semicircle shown on the right.



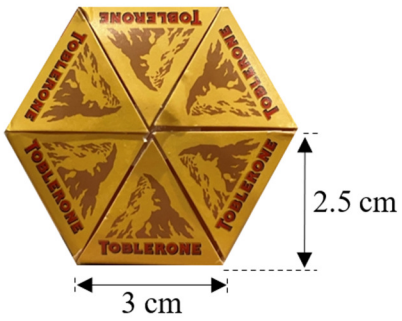


16) A backyard ice rink consists of a rectangular middle section and semicircular ends, as shown in the diagram on the left.
   a) Determine the perimeter of the rink.
   b) Determine the area of the rink.
   c) If the ice has a thickness of 0.2 feet, determine the volume of ice used for the rink.

17) 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.

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

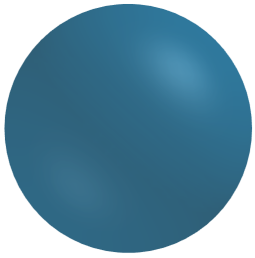
18) A box in the shape a hexagonal prism tightly holds six chocolate bars, each packaged in a triangular prism-shaped box, as shown below. The triangular face of each individual chocolate bar box has a base of 3 cm and a height of 2.5 cm. The length of the hexagonal box is 17 cm.
a) Determine the area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



PART C

19) 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.

20) 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 $A = 4\pi r^2$.



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

21) A pyramid and a rectangular prism have identical bases and the same volume. How do the heights of the two objects compare?

22) 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.

23) The lateral surface of a cylinder has an area of 824 m^2. The cylinder has a height of 40 m.
a) Determine the circumference of the cylinder's circular face.
b) Determine the volume of the cylinder.

ANSWERS

1) a) 22 cm b) 22 m c) 47.0 in d) 50 mm e) 49.6 ft f) 20.5 cm
2) a) 28 cm^2 b) 18 m^2 c) 101.4 in^2 d) 150 mm^2 e) 126.4 ft^2 f) 18 cm^2
3) a) 4.2 cm b) 26.4 cm c) 55.4 cm^2
4) a) 4271.0 in^3 b) 96 ft^3 c) 628.3 cm^3
5) a) 1642.7 in^2 b) 161.6 ft^2 c) 408.4 cm^2
6) volume $\approx$ 307.5 m^3, surface area $\approx$ 273.4 m^2
7) a) volume = 297 cm^3, surface area = 295.2 cm^2
b) volume = 1588.6 m^3, surface area = 831.3 m^2
8) 891 cm^3
9) 52.8 m
10) 1232 ft^3
11) a) 65.4 in^3 b) 3 c) 95.1 in^2 d) 76.9 in^2
12) a) $3\frac{55}{64}$ in^2 b) $21\frac{29}{128}$ in^3
13) 31.2 m
14) 31.8 mm
15) area $\approx$ 19.2 ft^2, perimeter $\approx$ 18.0 ft
16) a) 102.8 ft b) 714.2 ft^2 c) 142.8 ft^3
17) 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.
18) a) 22.5 cm^2 b) 382.5 cm^3 c) 351 cm^2
19) 924.41 cm^2
20) a) 523.6 cm^3 b) 2533.9 mm^2 c) 22 235.69 m^3
21) The height of the pyramid is 3 times the height of the rectangular prism.
22) 8.7 cm
23) a) 20.6 m b) 1350.8 m^3