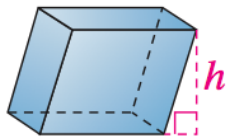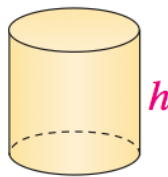Prisms and cylinders can be *right* or *oblique*.
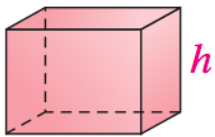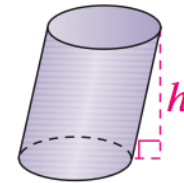


Right prism    Oblique prism    Right cylinder    Oblique cylinder

In this text, you may assume that prisms and cylinders are right unless otherwise stated.

### WHAT YOU'LL LEARN

➢ **To find surface areas and volume of prisms**

➢ **To find surface areas and volume of cylinders**

One way to find the surface area of a space figure is to find the area of its net. You measure surface area in square units. Another way to find the surface area is to use the lateral area and the base areas. Lateral area (L.A.) of a solid is the sum of the areas of the lateral faces.

**SURFACE AREA OF PRISM**

**2(AREA OF THE BASE) + (PERIMETER OF THE BASE ●HEIGHT)**

To determine the volume of a right prism, determine the area of the base and multiply it by the height.

**VOLUME OF PRISM**

**AREA OF THE BASE ● HEIGHT**

## EXAMPLES:

**Find the surface area and volume of the following:**

**SOLUTION A:**

Given:    B = 5(10) = 50 in.$^2$

          P = 30 in

          h = 6 in.

Surface Area:                Volume:

   S = 2B + Ph                 $V = Bh$

   $SA = 2(50) + 30(6)$        $V = (10)(5)(6)$

   $SA = 280in^2$             $V = 300in^3$

a.

6 in.

5 in.

10 in.
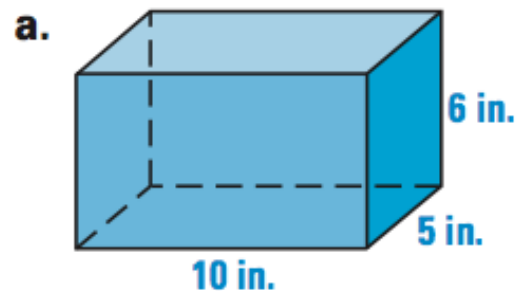
## SOLUTION B:

Given:
s = 7m

P = 21 m

h = 5 m

**b.**

7 m  7 m

5 m

7 m

**Area of base:**

$$B = \frac{\sqrt{3}}{4}(s^2)$$

$$B \approx 21.22m^2$$

**Surface Area:**

$$SA = 2B + Ph$$

$$SA = 2(21.22) + 21(5)$$

$$SA = 42.44 + 105$$

$$SA \approx 147.44m^2$$

**Volume:**

$$V = Bh$$

$$V = (21.22)(5)$$

$$V = 107.75m^3$$
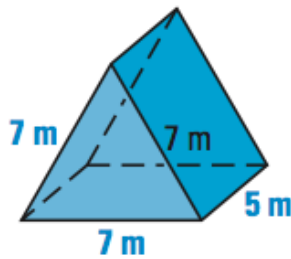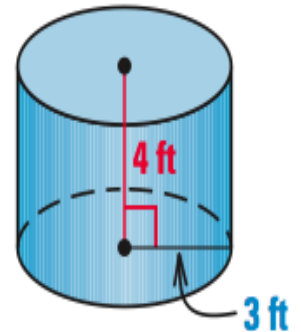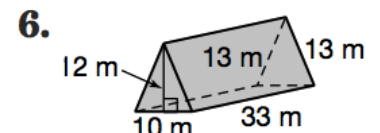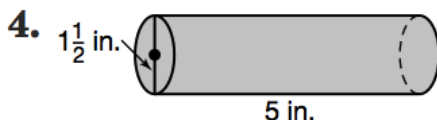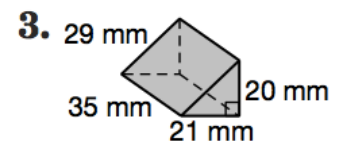
## SOLUTION C:

Given:
r = 3 ft

h = 4 ft

**Surface Area:**

S = 2B + Ph

$$SA = 2\pi r^2 + 2\pi rh$$

$$SA = 2\pi(3^2) + 2\pi(3)(4)$$

$$SA = 18\pi + 24\pi$$

$$SA = 42\pi$$

**Volume:**

V = Bh

$$V = \pi r^2 h$$

$$V = \pi(3^2)4$$

$$V = 36\pi$$

**c**

4 ft

3 ft

---

**PRACTICE** ANSWER:

**EVEN Numbers for your SEATWORK;**
**ODD numbers for your ASSIGNMENT**

---

Find the surface area of each solid. Round to the nearest tenth.

**1.**

5 ft
3 ft
8 ft

**2.**
4.7 m

12 m

**3.** 29 mm

35 mm
20 mm
21 mm

**4.** $1\frac{1}{2}$ in.

5 in.

**5.**
3 cm
3 cm

10 cm

**6.**
12 m
13 m
13 m

10 m
33 m
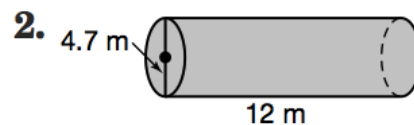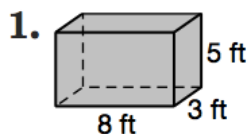
1) A closed wooden box measures externally as 42 cm by 32 cm by 27 cm. The wood used is 1 cm thick. Find the internal capacity (volume) of the box.

2) A skyscraper is a rectangular prism with a height of 414 meters. The bases are squares with sides that are 64 meters. What is the surface area of the skyscraper (including both bases)?

3) A cylindrical tank is 2.6 meters high. If the radius of its base is 0.92 meters, what is its surface area?

4) A rectangular swimming pool is 50 m long and 25 m wide. It is filled to a height of 1.5 m. How many cubic meters of water must be added to fill the pool to a height of 2 m.

References:

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3/Lesson_10.7.pdf

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