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Surface Areas of Prisms and Cylinders

Objective – Find the surface area of prisms and cylinders.

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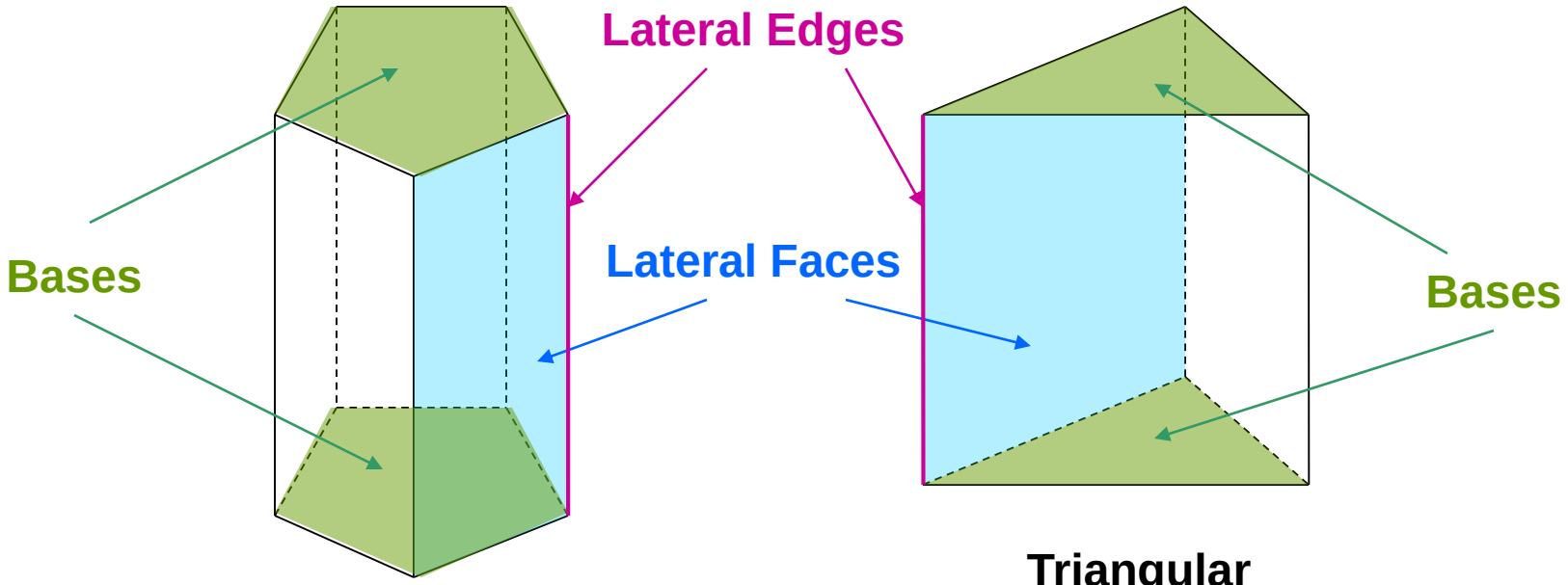
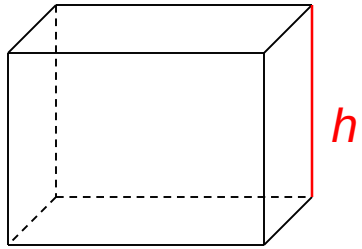
Types of Prisms

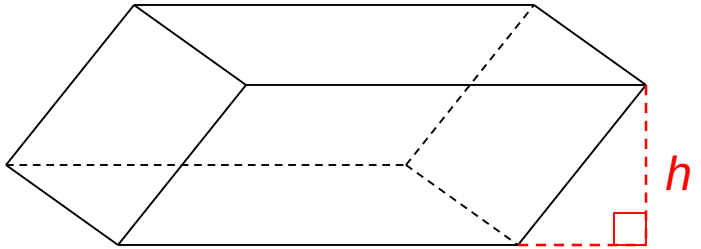


Pentagonal Prism

Triangular Prism



Right Prism



Oblique Prism

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Formulas You Need to Remember:

- Area of a Triangle → $A = bh \div 2$
- Area of Parallelogram → $A = bh$
- Area of Trapezoid → $A = h(b_1 + b_2) \div 2$

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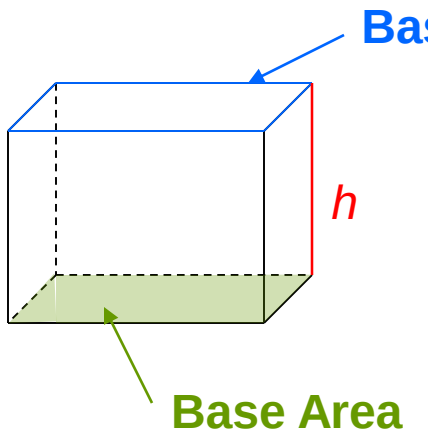
Key Concept(s):

- **Lateral Area and Surface Area of a Prism**



$$L.A. = ph$$

Lateral Area — Base Perimeter — Height

$$S.A. = L.A. + 2B$$

Surface Area — Lateral Area — Area of the Base(s)

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#1 Finding the Surface Area of a Prism

- Find the surface area of the regular hexagonal prism.

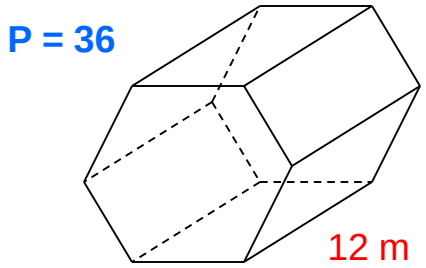
$$S.A. = L.A. + 2B$$

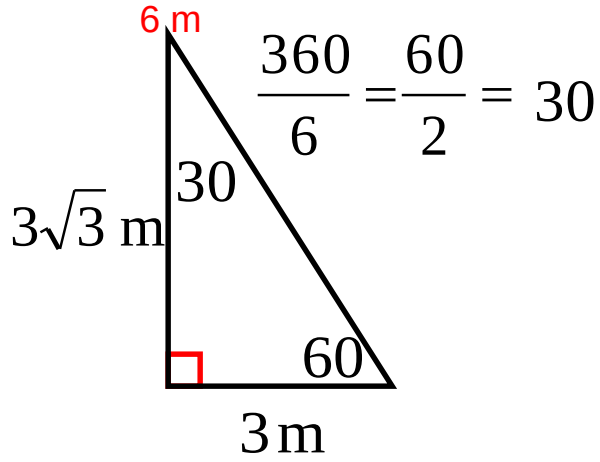
$$L = 432\,\text{m}^2 \qquad B = 93.5\,\text{m}^2$$

$$S = 432 + 2(93.5)$$

$$S = 432 + 187$$

$$\boxed{S = 619\,\text{m}^2}$$





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#2 Finding the Surface Area of a Prism

- Find the surface area of the triangular prism.

$$S.A. = L.A. + 2B$$

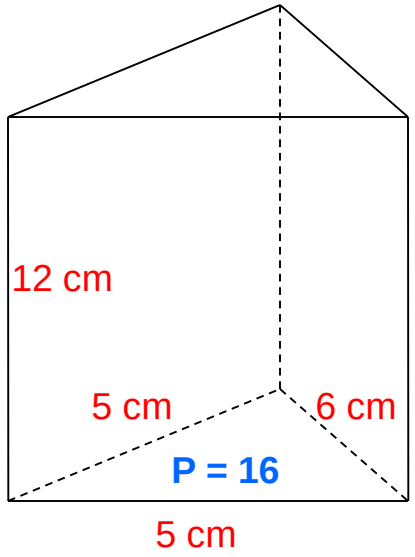
$$L.A. = Ph \qquad B = \frac{1}{2}bh$$

$$L.A. = 16(12) \qquad B = 0.5(6)(5)$$

$$L.A. = 192\,\text{cm}^2 \qquad B = 15\,\text{cm}^2$$

$$S.A. = 192 + 2(15)$$

$$\boxed{S.A. = 222\,\text{cm}^2}$$



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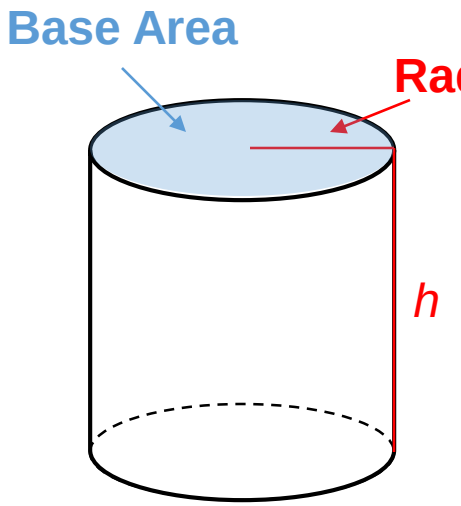
Key Concept(s):

- **Lateral Area and Surface Area of a Cylinder**



$$L.A. = 2\pi rh$$

Lateral Area — Radius — Height

$$S.A. = L.A. + 2B$$

Surface Area — Lateral Area — Base Area

$$B = \pi r^2$$

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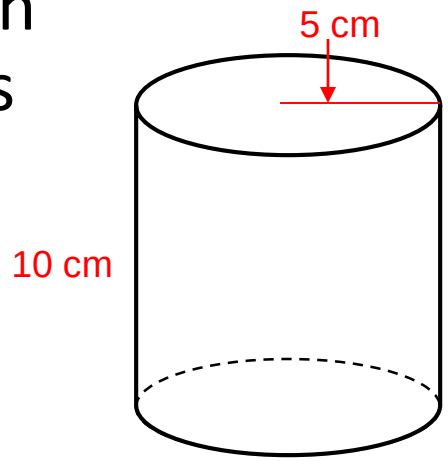
#3 Finding the Surface Area of a Cylinder

- Find the surface area of a cylinder with height 10 cm and radius 5 cm in terms of pi.



$$S.A. = L.A. + 2B$$

$$L.A. = 2\pi rh \qquad B = \pi r^2$$

$$L.A. = 2\pi(5)(10) \qquad B = \pi(5)^2$$

$$L.A. = 100\pi \text{ cm}^2 \qquad B = 25\pi \text{ cm}^2$$

$$S.A. = 100\pi + 2(25\pi) \qquad S.A. = 150\pi \text{ cm}^2$$

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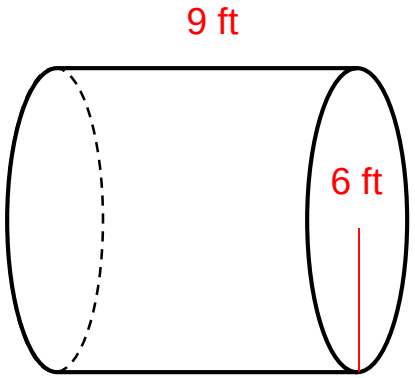
#4 Finding the Surface Area of a Cylinder

- Find the surface area of a cylinder with radius 6 ft and height 9 ft in terms of pi.

$$S.A. = L.A. + 2B$$



$$L.A. = 2\pi rh \qquad B = \pi r^2$$

$$L.A. = 2\pi(6)(9) \qquad B = \pi(6)^2$$

$$L.A. = 108\pi \text{ ft}^2 \qquad B = 36\pi \text{ ft}^2$$

$$S.A. = 108\pi + 2(36\pi) \qquad \boxed{S.A. = 180\pi \text{ ft}^2}$$

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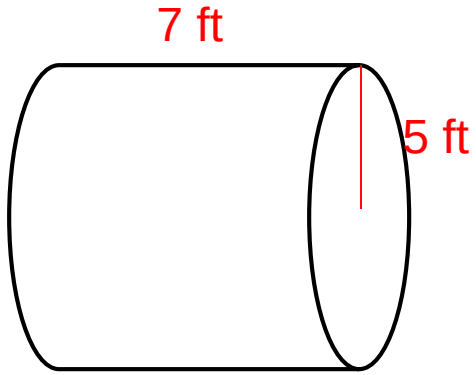
Example:

- Find the surface area of a cylinder with radius 3 ft and height 6 ft.
- *S.A. = 2πrh + 2B*



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Example:

- Find the surface area of the triangular prism.
- *S.A. = ph + 2B*