Surface Area of Cones

Lesson 8.5
The lateral area $L.A.$ of a cone is $\pi$ times the radius times the slant height $\ell$.

$$L.A. = \pi r \ell$$
1. Find the lateral area of the cone. Round to the nearest tenth.

Write the formula: \[ L.A. = \pi r \ell \]

Substitute the values: \[ L.A. = \pi \cdot 5 \cdot 13 \]

Multiply: \[ L.A. \approx 204.2 \]

204.2 square millimeters
a. Find the lateral area of a cone with a radius of 4 inches and a slant height of 9.5 inches. Round to the nearest tenth.

\[ L.A. = \pi r \ell \]
\[ L.A. = \pi (4)(9.5) \]

\[ \boxed{119.4 \text{ in}^2} \]

b. Find the lateral area of a cone with a diameter of 16 centimeters and a slant height of 10 centimeters. Round to the nearest tenth.

\[ r = \frac{16}{2} = 8 \]
\[ L.A. = \pi r \ell \]
\[ L.A. = \pi (8)(10) \]

\[ \boxed{251.3 \text{ cm}^2} \]
Surface Area of a Cone

The surface area $S.A.$ of a cone with slant height $\ell$ and radius $r$ is the lateral area plus the area of the base.

$$S.A. = \pi r \ell + \pi r^2$$
Example

2. Find the surface area of the cone. Round to the nearest tenth.

Write the formula:
\[ \text{S.A.} = \pi r \ell + \pi r^2 \]

Substitute the values:
\[ \text{S.A.} = \pi \cdot 6 \cdot 6.2 + \pi \cdot 6^2 \]

Multiply:
\[ \text{S.A.} \approx 230.0 \]

230.0 square inches
c. Find the surface area of the cone. Round to the nearest tenth.

\[
S.A. = \pi r \ell + \pi r^2
\]

\[
S.A. = \pi(4.5)(20) + \pi(4.5)^2
\]

\[
282.74 + 63.62
\]

\[
346.4 \text{ mm}^2
\]
Find the surface area of each cone. Round to the nearest tenth.

Find the surface area of a cone with base radius $r = \frac{25}{2} = 12.5$ in.

\[
S.A. = \pi rl + \pi r^2
\]

\[
S.A. = \pi (12.5)(20) + \pi (12.5)^2
\]

\[
785.4 + 490.87 = 1,276.3 \text{ in}^2
\]
HOMEWORK:

Pg. 635 - 638

# 1-21 (all)