9 TAKS PREPARATION

TEXAS TAKS Obj. 8
TEKS 8.8.A-B

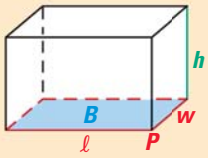
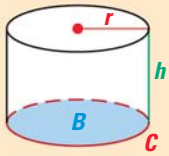
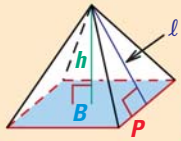
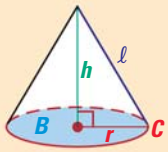
REVIEWING PROBLEMS INVOLVING NETS OF SOLIDS

A net is a two-dimensional representation of a three-dimensional solid. Using a ruler, you can measure the dimensions of a net to determine the total surface area S, the lateral surface area L, and the volume V of the solid that the net represents. In the formulas shown, solids with a base have a base area B and a base perimeter P (or base circumference C).

REWRITE FORMULAS

If you know formulas for the base area B and the base perimeter P (or base circumference C), you can rewrite the formulas at the right. For instance, substituting ℓw for B and $2w + 2\ell$ for P into the formulas for a rectangular prism gives $V = \ell wh$, $S = 2\ell w + 2wh + 2\ell h$, and $L = 2wh + 2\ell h$.

Common Volume and Surface Area Formulas

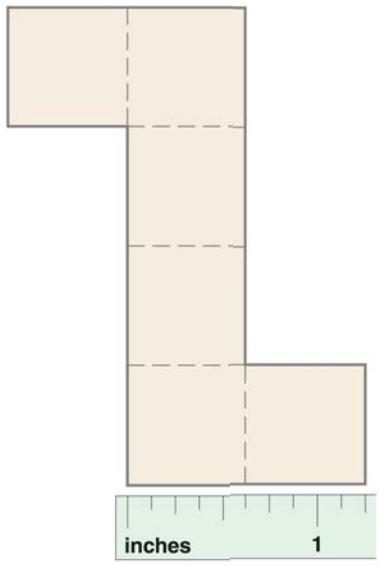
Prism	Cylinder	Pyramid	Cone	Sphere
				
$V = Bh$	$V = Bh$	$V = \frac{1}{3}Bh$	$V = \frac{1}{3}Bh$	$V = \frac{4}{3}\pi r^3$
$S = 2B + Ph$	$S = 2B + Ch$	$S = B + \frac{1}{2}P\ell$	$S = B + \pi r\ell$	$S = 4\pi r^2$
$L = Ph$	$L = Ch$	$L = \frac{1}{2}P\ell$	$L = \pi r\ell$	

USE A SPECIAL CASE

A cube is a prism for which $\ell = w = h$. For a cube with an edge length of s, the volume is $V = s^3$, the total surface area is $S = 6s^2$, and the lateral surface area is $L = 4s^2$.

EXAMPLE

The net of a cube is shown. Use a ruler to determine the dimensions of the cube to the nearest $\frac{1}{8}$ inch. Find the total surface area of the cube to the nearest square inch.



Solution

In order to find the total surface area S of the cube, you need to know its edge length s. Because all edge lengths are equal for a cube, it is necessary to measure only one length. The edge length of the cube is $\frac{5}{8}$ inch.

$$S = 6s^2 = 6\left(\frac{25}{64}\right) \approx 2.3$$

▶ The cube has a total surface area of about 2 square inches.