Standards 8, 10, 11

Classifying Solids

Classifying Pyramids

Surface Area of Pyramids

Volume of a Right Pyramid

Reviewing Perimeters

PROBLEM 1

PROBLEM 2

END SHOW

Standard 8:

Students know, derive, and solve problems involving perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.

Estándar 8:

Los estudiantes saben, derivan, y resuelven problemas involucrando perímetros, circunferencia, área, volumen, área lateral, y superficie de área de figuras geométricas comunes.

Standard 10:

Students compute areas of polygons including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.

Estándar 10:

Los estudiantes calculan áreas de polígonos incluyendo rectángulos, triángulos escalenos, triángulos equiláteros, rombos, paralelogramos, y trapezoides.

Standard 11:

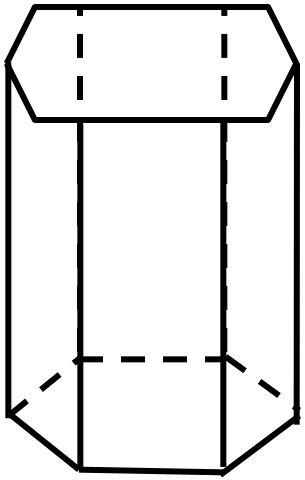
Students determine how changes in dimensions affect the perimeter, area, and volume of common geomegtric figures and solids.

Estándar 11:

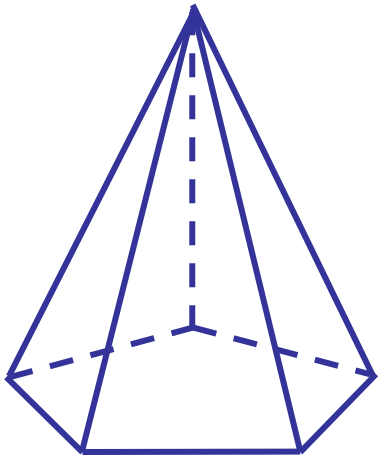
Los estudiantes determinan cambios en dimensiones que afectan perímetro, área, y volumen de figuras geométricas comunes y sólidos.

SOLIDS

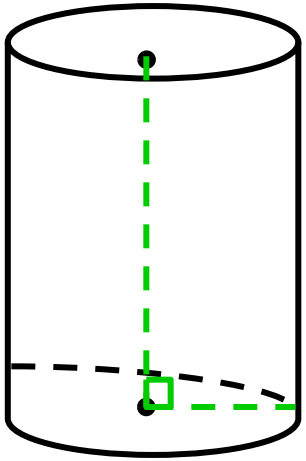
Standards 8, 10, 11



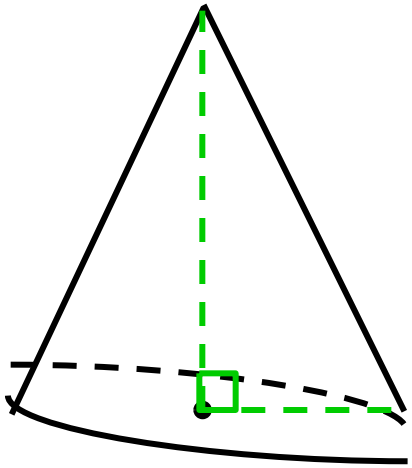
PRISM



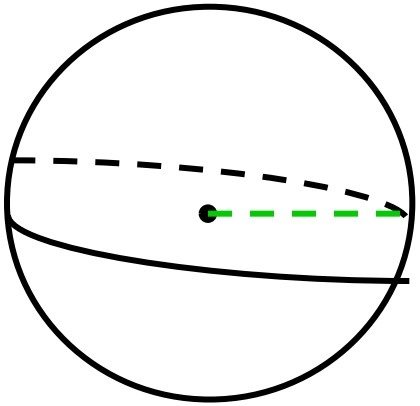
PYRAMID



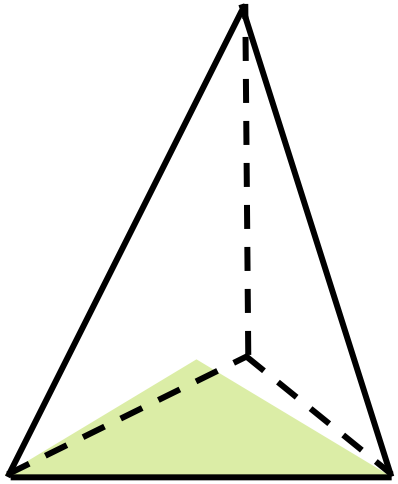
CYLINDER



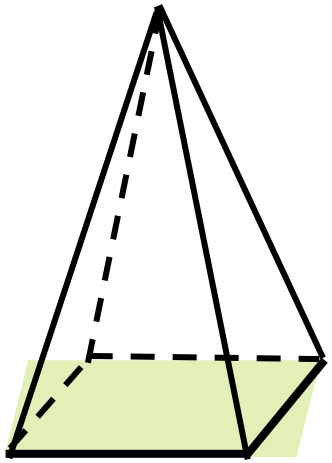
CONE



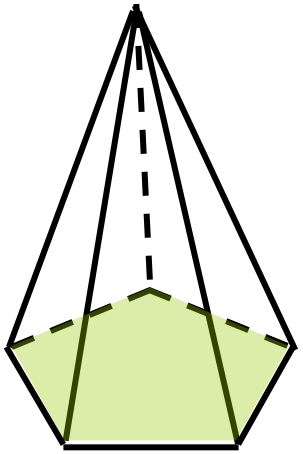
SPHERE



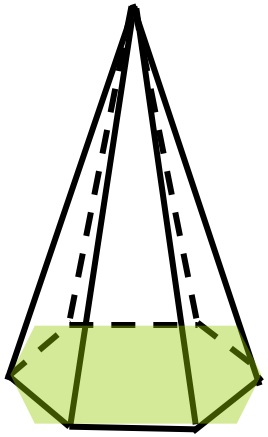
TRIANGULAR PYRAMID



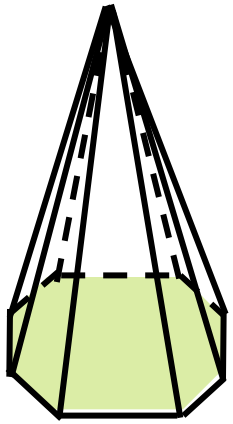
RECTANGULAR PYRAMID



PENTAGONAL PYRAMID



HEXAGONAL PYRAMID



OCTAGONAL PYRAMID

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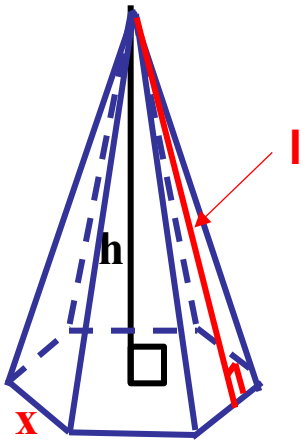
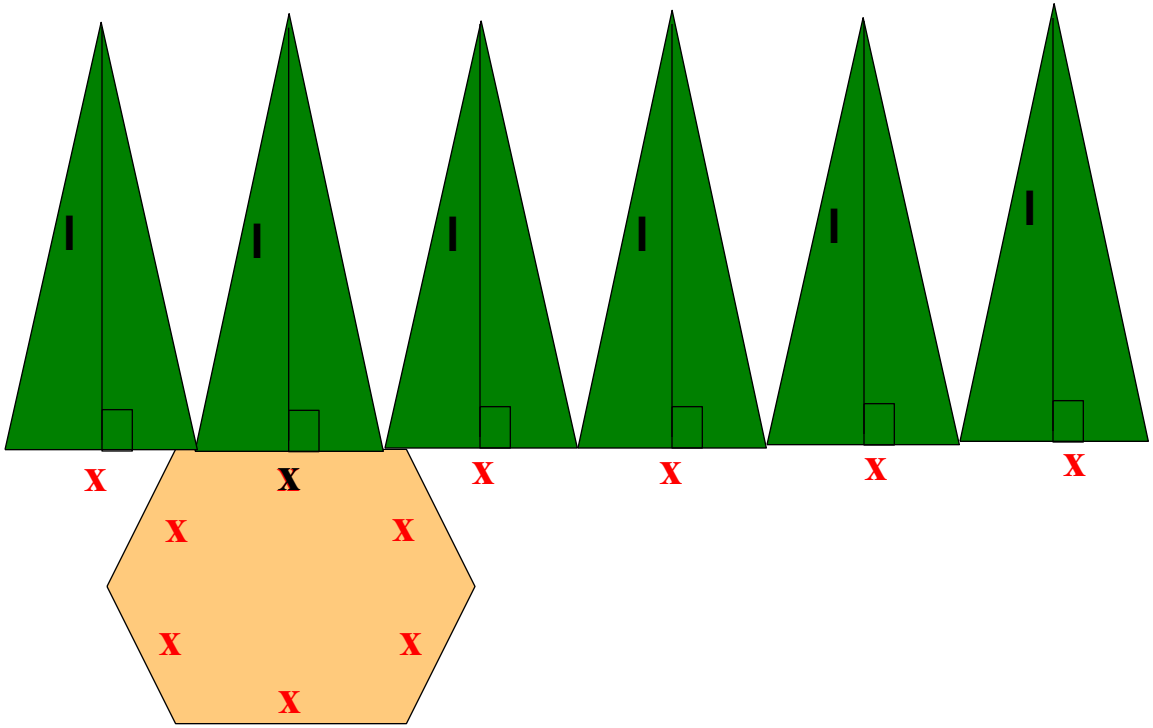
SURFACE AREA IN PYRAMIDS





Calculating Lateral Area:

$$L = \frac{1}{2}xl + \frac{1}{2}xl + \frac{1}{2}xl + \frac{1}{2}xl + \frac{1}{2}xl + \frac{1}{2}xl$$

$$L = \frac{1}{2}l\left(x + x + x + x + x + x\right)$$

The perimeter of the BASE is:

$$P = x + x + x + x + x + x$$

LATERAL AREA IS:

$$L = \frac{1}{2}lP \quad \text{or} \quad \boxed{L = \frac{1}{2}Pl}$$

TOTAL SURFACE AREA:

$$\boxed{T = \frac{1}{2}Pl + B}$$

P= perimeter of base

B= Area of base polygon

l= slant height

h= height

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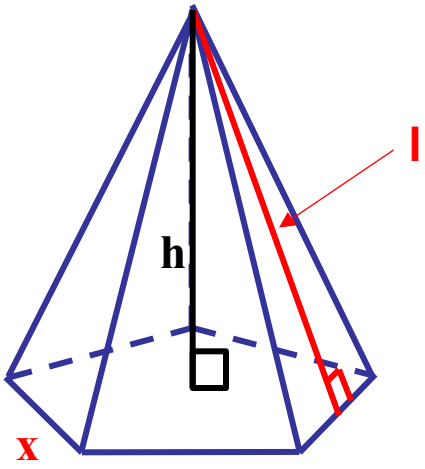
VOLUME OF A PYRAMID:



$$V = \frac{1}{3}Bh$$

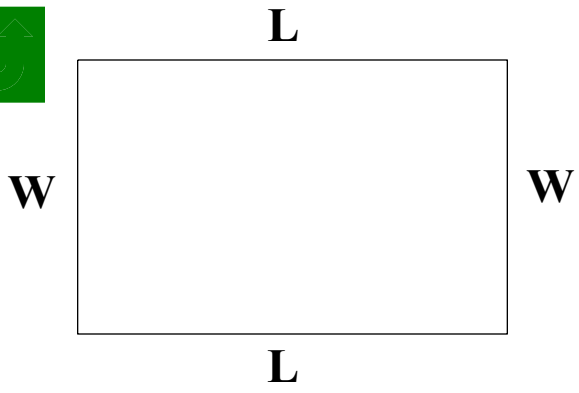
where:

B= Area of the base

h= height

REVIEWING PERIMETERS

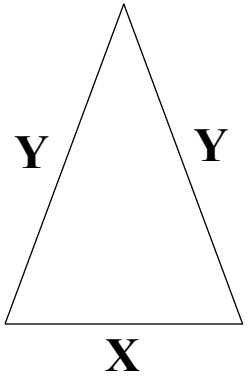
Standards 8, 10, 11



P = L + W + L + W

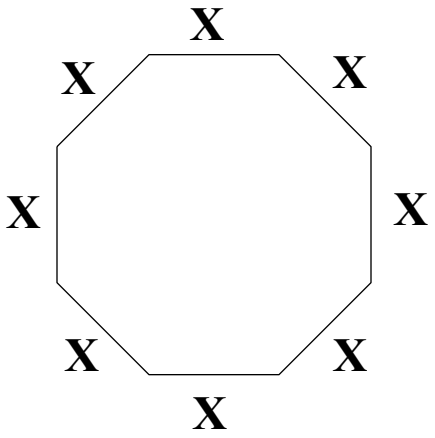
P = L + L + W + W

P = 2L + 2W



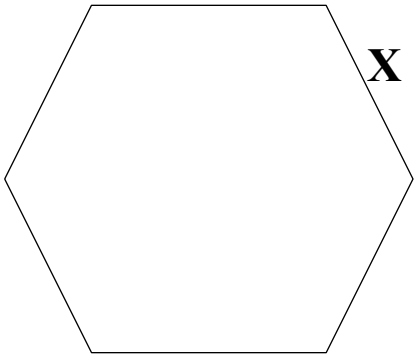
P = Y + Y + X

P = 2Y + X

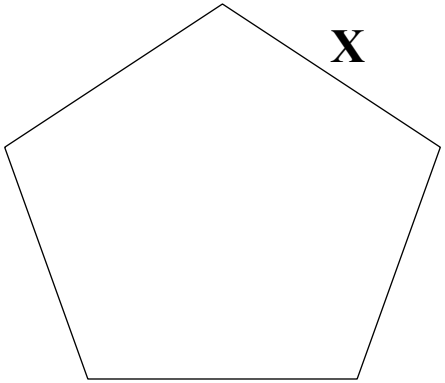


P = X + X + X + X + X + X + X + X

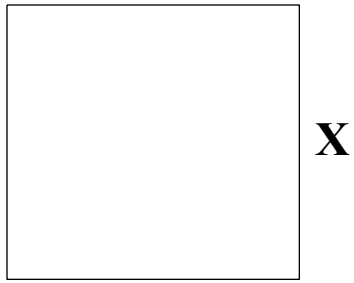
P = 8X



P = 6X

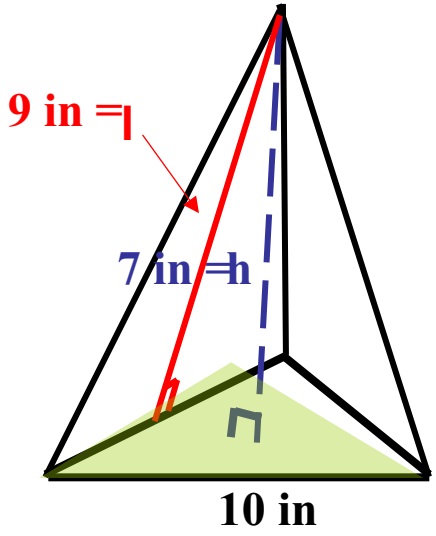


P = 5X



P = 4X

Find the lateral area and the surface area and volume of a right pyramid whose slant height is 9 in and whose height is 7 in. Its base is an equilateral triangle whose side is 10 in. Round your answers to the nearest tenth.



LATERAL AREA:

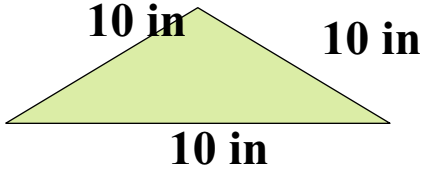
$L = \frac{1}{2} Pl$

$L = \frac{1}{2}(30 \text{ in})(9 \text{ in})$

$L = (15 \text{ in})(9 \text{ in})$

$\boxed{L = 135 \text{ in}^2}$

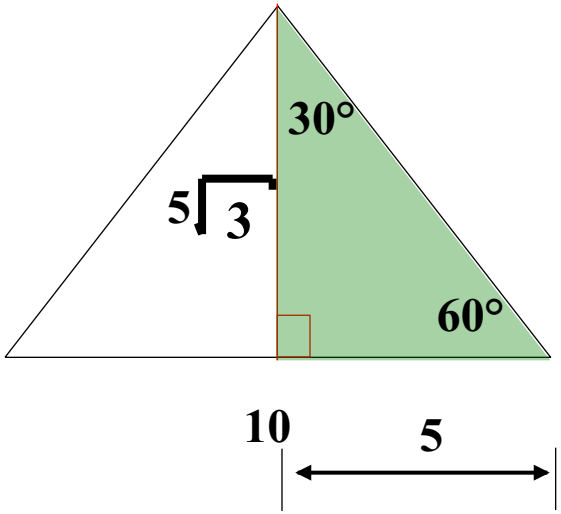
Base perimeter:



$P = 3(10 \text{ in})$

$P = 30 \text{ in}$

Base Area:



$B = \frac{1}{2}(10)\left(5\sqrt{3}\right)$

$= 5\left(5\sqrt{3}\right)$

$= 25\sqrt{3} \text{ in}^2$

TOTAL SURFACE AREA:

$T = \frac{1}{2} Pl + B$

$T = 135 \text{ in}^2 + 25\sqrt{3} \text{ in}^2$

$T = 135 \text{ in}^2 + 43.3 \text{ in}^2$

$\boxed{T = 178.3 \text{ in}^2}$

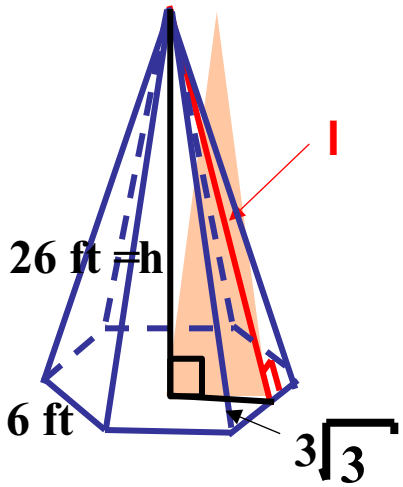
VOLUME:

$V = \frac{1}{3} B h$

$V = \frac{1}{3}(25\sqrt{3} \text{ in}^2)(7 \text{ in})$

$\boxed{V \approx 101 \text{ in}^3}$

Find the lateral area, the surface area and volume of a right pyramid with a height of 26 ft whose base is a regular hexagon with side of 6 ft. Round your answers to the nearest tenth.



Calculating base area:

Perimeter:

$P = 6(6 \text{ feet})$

$P = 36 \text{ feet}$

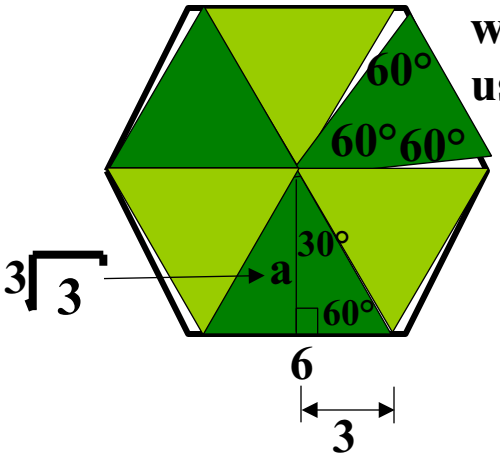
$B = \frac{1}{2}Pa$

$B = \frac{1}{2}(36)(3\sqrt{3})$

$= (18)(3\sqrt{3})$

$B = 54\sqrt{3} \text{ feet}^2$

$B \approx 93.5 \text{ feet}^2$



we need to find the slant height, using the Pythagorean Theorem:

$l^2 = 26^2 + (3\sqrt{3})^2$

$l^2 = 676 + 27$

$\sqrt{l^2} = \sqrt{703}$

$l \approx 26.5 \text{ ft}$

$3^2(\sqrt{3})^2$

$(9)(3)$

27

LATERAL AREA:

$L = \frac{1}{2}Pl$

$L = \frac{1}{2}(36 \text{ ft})(26.5 \text{ ft})$

$L = (18 \text{ ft})(26.5 \text{ ft})$

$L = 477 \text{ ft}^2$

TOTAL SURFACE AREA:

$T = \frac{1}{2}Pl + B$

$T = 477 \text{ ft}^2 + 93.5 \text{ ft}^2$

$T \approx 570.5 \text{ ft}^2$

VOLUME:

$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(93.5 \text{ ft}^2)(26 \text{ ft})$

$V \approx 810. \text{ ft}^3$