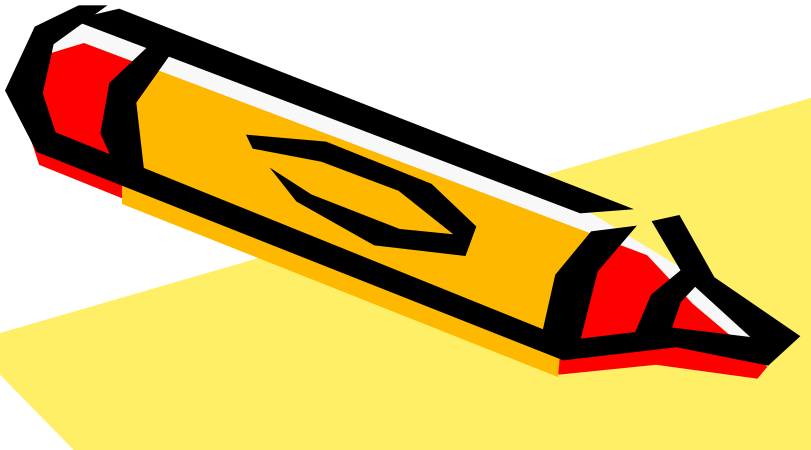
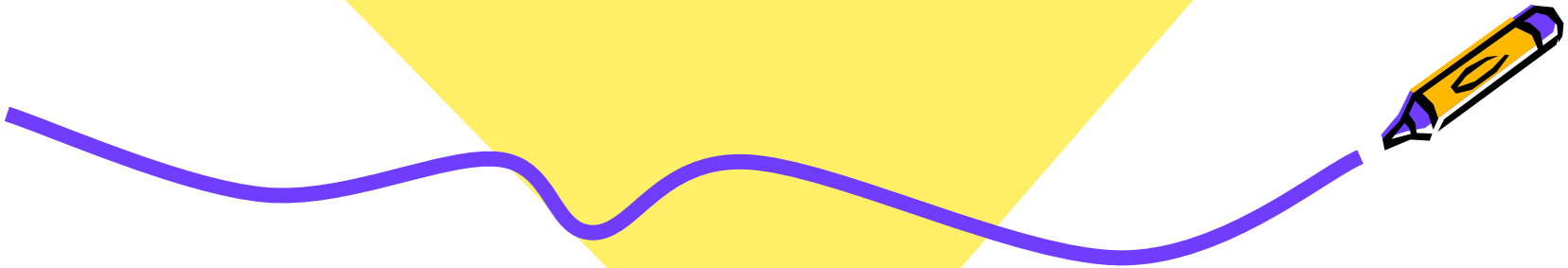


Geometry

Surface Area



Surface Area

Surface Area: The sum of the areas of the faces (surfaces or sides) of a figure. Area is in units squared.

EX. Find the surface area of a cube with a side of 2 in.

There are 6 equal sides.

The area of each side is 4.

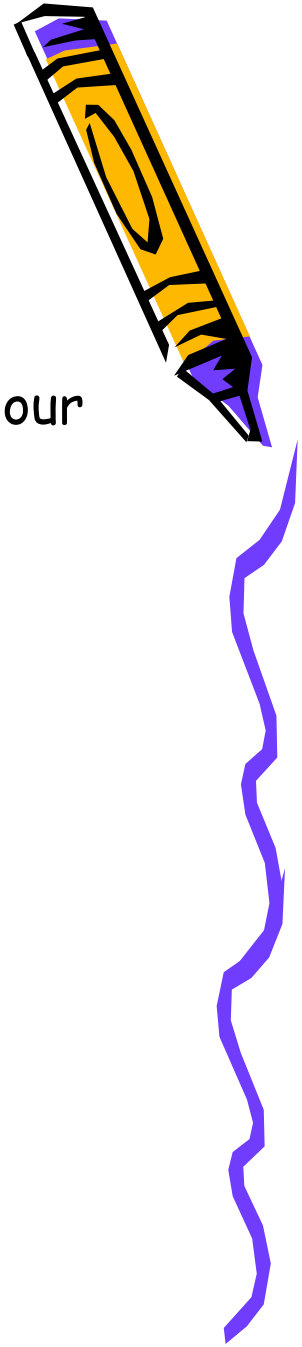
The surface area is:

24 square inches (sq. in.)

24 inches squared (in. sq.)

24 in^2

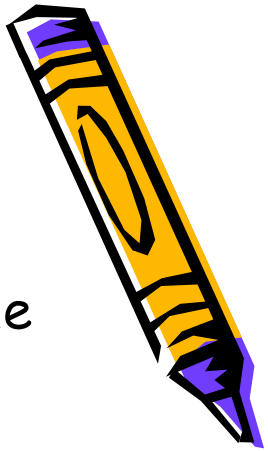
Surface Area



Most of the basic formulas we'll need are provided on our formula reference sheet.

Let's highlight a few of the more challenging…

Surface Area of a Prism



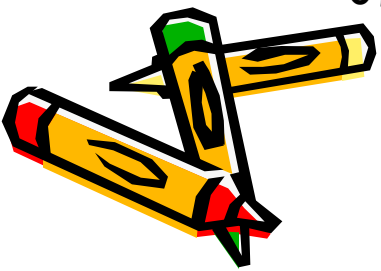
Prism: polyhedron with two congruent faces (the bases) that lie in two parallel planes

Lateral Faces: the other faces of a prism that are not the bases

Prism

$$SA = 2 * (area\ of\ a\ base) + \text{the sum of the areas of all the lateral faces}$$

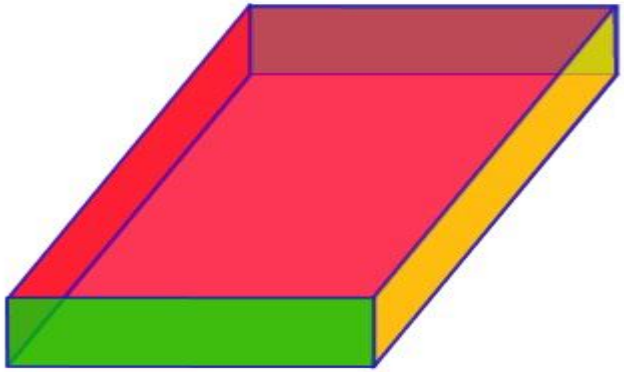
The number of lateral faces is determined by the number of sides of the base. The lateral faces will be congruent only if the base is a regular polygon

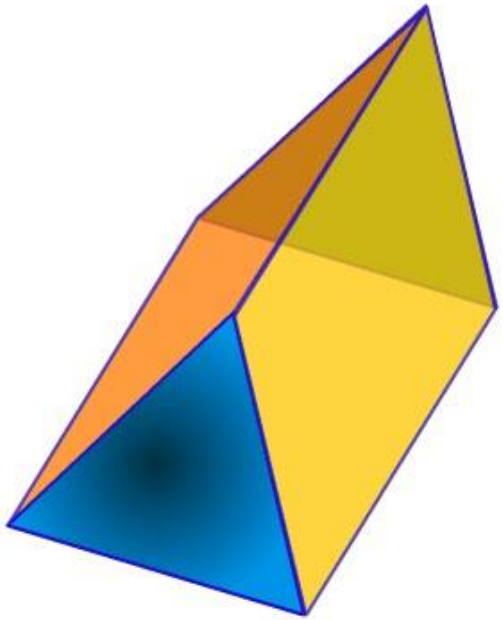


Surface Area of a Prism

Prism

$$SA = 2 * (area\ of\ a\ base) +$$
$$the\ sum\ of\ the\ areas\ of\ all\ the\ lateral\ faces$$



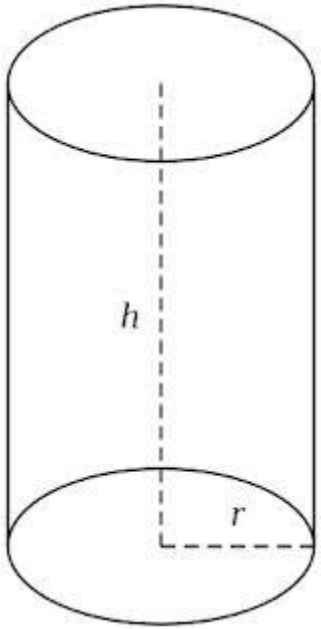


Surface Area of a Cylinder

A cylinder is the equivalent of a cylindrical prism whose surface area can be calculated in the same manner.

Cylinder

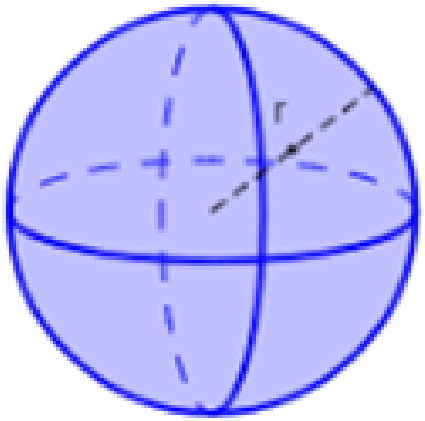
$$SA = 2(\pi r^2) + 2\pi rh$$



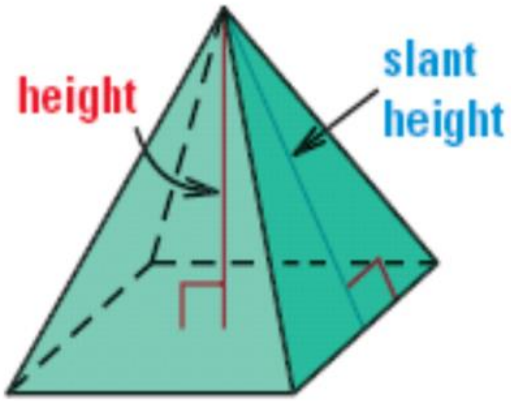
Surface Area of a Sphere

Sphere

$$SA = 4(\pi r^2)$$



Surface Area of a Regular Pyramid

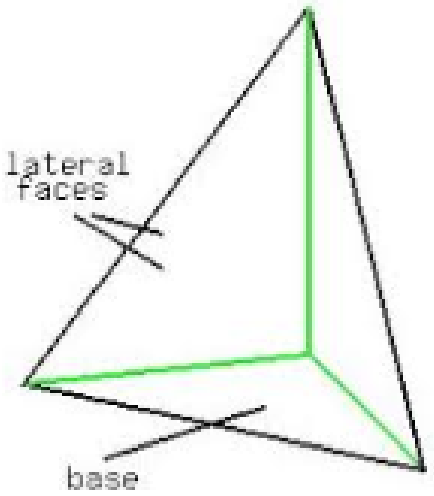


Regular pyramid

$$SA = (area\ of\ the\ base) + \frac{1}{2} * (perimeter\ of\ the\ base) * (slant\ hieght)$$

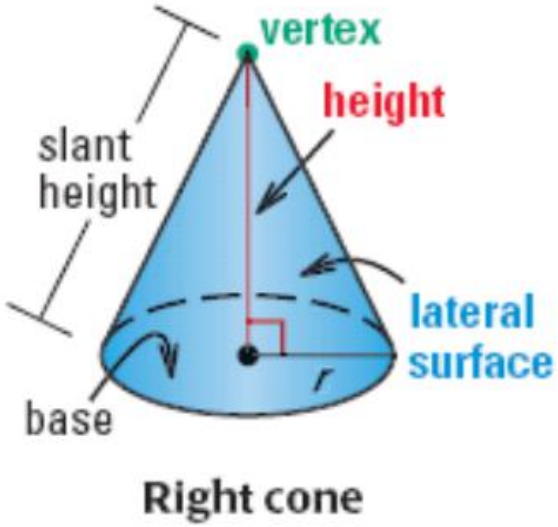
Surface Area of a Pyramid

The number of lateral faces is determined by the number of edges of the base. If the base is a regular polygon, then all lateral faces are congruent.



$$SA = (\textit{area of the base}) + \textit{(area of each lateral face)}$$

Surface Area of a Cone



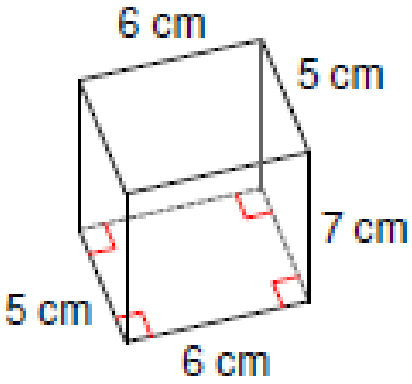
Right cone

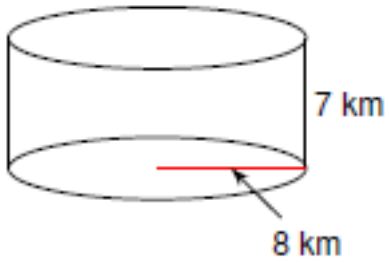
$$SA = \pi r^2 + \pi r l$$

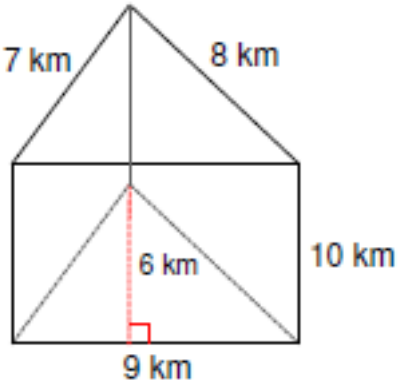
Where l is the slant height

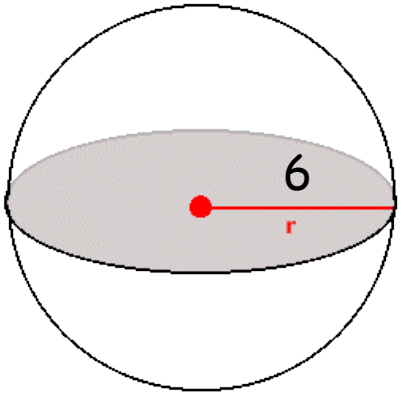
Surface Area

Find the surface area of each figure.



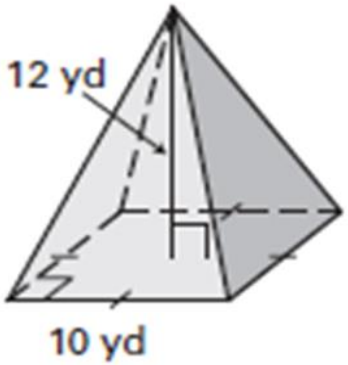


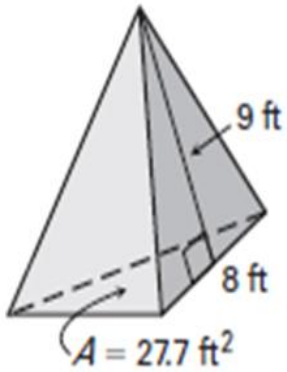


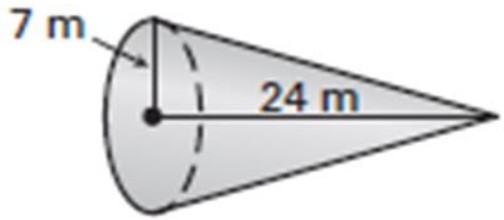


Surface Area

Find the surface area of each figure.







Volume and Surface Area

Find the height of a prism with a volume of 648 cubic inches and a base whose area is 36 inches.

A cylinder has a height of 4 meters and a volume of about 452.4 cubic meters. What is the diameter of the base of the cylinder?

Volume and Surface Area

Find the volume and surface area of each figure.