

Geometry Formulas

Note:

b (lower case) refers to the length of a side that is perpendicular to the height, h;
b and h are *always perpendicular to each other*

B (upper case) refers to area of the base

Perimeter, p

perimeter is the distance around an object, found by adding the lengths of the sides; units are linear such as ft, m, in, km

parallelogram $p = 2l + 2w$; note this applies to the rectangle, square, and rhombus, since they are all parallelograms

square $p = 4s$ where *s* is side length

circle (circumference) $C = 2\pi r$

Area, A

area is the number of unit squares that fill a two-dimensional space; units are square units such as ft², m², in², and km².

triangle $A = \frac{1}{2}bh$

circle $A = \pi r^2$

regular polygon $A = \frac{1}{2}ap$, where *a* = apothem and *p* = perimeter; apothem is the length of the perpendicular segment from the center to the side of the polygon

parallelogram $A = bh$ for all parallelograms
a parallelogram is a quadrilateral where opposite sides are both parallel and congruent; opposite angles are congruent; consecutive angles are supplementary; diagonals bisect each other

rectangle *a parallelogram* with all 90° angles; diagonals are congruent
 $A = bh$ or lw

rhombus *a parallelogram* with 4 congruent sides; diagonals are perpendicular bisectors; $A = bh$ or $\frac{1}{2}d_1d_2$, where d_1 and d_2 are lengths of diagonals

square *a parallelogram* with all sides congruent and all angles of 90°
 $A = bh$ or s^2 where *s* = side length

trapezoid a quadrilateral with one set of parallel sides
 $A = \frac{b_1 + b_2}{2} \cdot h$ = average of base lengths times height

Kite $A = \frac{1}{2}d_1d_2$, where d_1 and d_2 are lengths of diagonals

Geometry Formulas

<u>Surface Area, SA</u>	surface area is found by adding the areas of the sides of a 3-dimensional shape; units are square units such as ft ² , m ² , in ² , and km ² .
sphere	$SA = 4\pi r^2$
pyramid	$SA = B + \frac{1}{2}pl$, where $p =$ perimeter of base and $l =$ slant height
cube	$SA = 6s^2$, where $s =$ side length; 6 sides, each with area of the square of the side length
rectangular prism	$SA = 2(lw + lh + wh)$
prisms in general	$SA = Bh$
cone	$SA = \pi r^2 + \pi rl$, where $r =$ radius and $l =$ slant height
cylinder	$SA = 2\pi r^2 + \pi rh$, where $r =$ radius and $h =$ height

<u>Volume</u>	volume is the number of unit cubes that fill a three-dimensional space; units are cube units such as ft ³ , m ³ , in ³ , and km ³ .
sphere	$V = \frac{4}{3}\pi r^3$
prism (in general)	$V = Bh =$ area of base times height
rectangular Prism	$V = lwh =$ area of rectangular base, lw , times height, h
pyramid	$V = \frac{1}{3}Bh$
cylinder	$V = \pi r^2 h =$ area of circle times height
cone	$V = \frac{1}{3}\pi r^2 h =$ one third of volume of a cylinder