

Lines are fundamental elements in geometry, characterized by their length and direction. Here are some common types of lines:

Straight Line:

A line that extends indefinitely in both directions and does not curve.



Curved line:

A curved line is a type of line that does not follow a straight path



Ray:

A part of a line that has one endpoint and extends infinitely in one direction.



Line Segment:

A part of a line that has two endpoints.



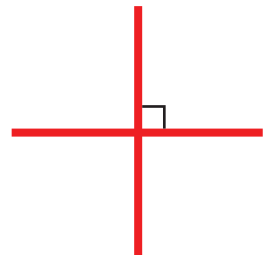
Parallel Lines:

Lines in the same plane that do not intersect. They remain equidistant from each other at all points.



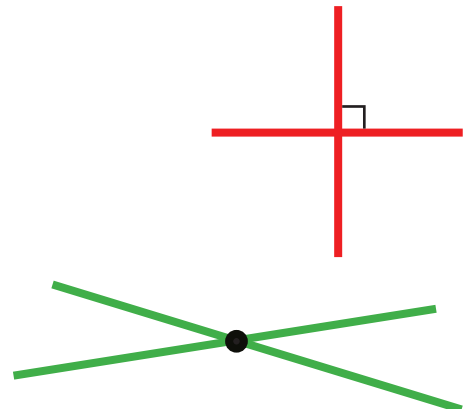
Perpendicular Lines:

Lines that intersect at a right angle (90 degrees).






Intersecting Lines:

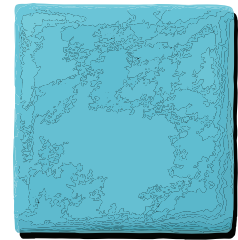
Lines that cross or meet at a common point.






Common 2D shapes include:

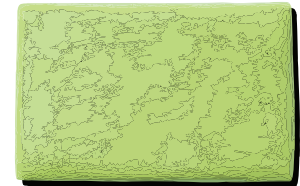
Square

-  All sides are equal in length.
-  All angles are right angles (90 degrees).
-  Opposite sides are parallel and equal in length.






Rectangle:

-  Opposite sides are equal in length.
-  All angles are right angles (90 degrees).
-  Opposite sides are parallel.






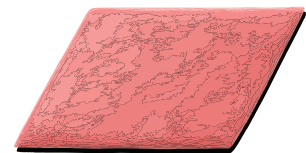
Circle:

-  No straight sides; consists of a curved boundary.
-  No angles.
-  All points on the boundary are equidistant from the center.






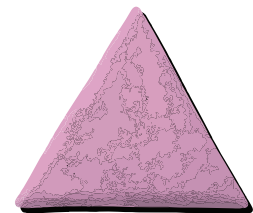
Parallelogram:

-  Opposite sides are equal in length.
-  Opposite angles are equal.
-  Opposite sides are parallel.





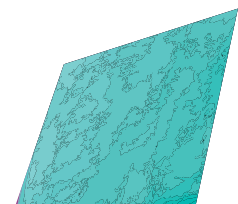
Triangle:

-  Three sides.
-  Three angles.
-  The sum of interior angles is always 180 degrees.

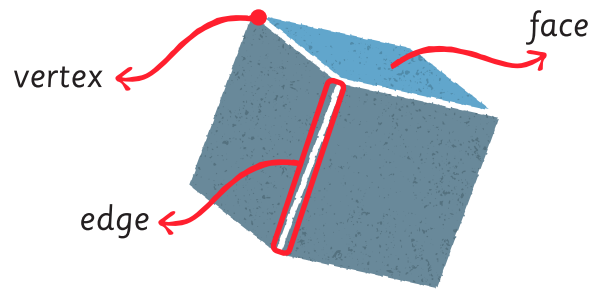


Trapezoid




-  At least one pair of parallel sides.
-  No sides are equal in length (unless it's an isosceles trapezoid).

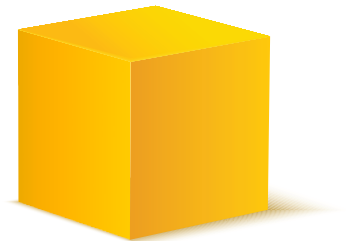


Common 3D shapes include:






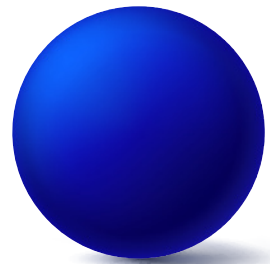
Cube:

-  All faces are squares.
-  All edges are equal in length.
-  All angles are right angles.





Sphere:

-  A perfectly round shape.
-  No edges or vertices.
-  All points on the surface are equidistant from the center.





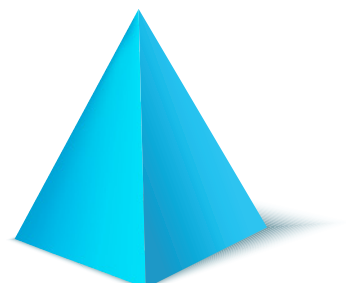
Cylinder:

-  No vertices.
-  Two circular faces.



Pyramid (with a square base):

-  Five faces.
-  Five vertices.



Area

Area is the amount of space inside a shape.

For example, if you want to find the area of your bedroom, you're measuring how much space is inside the room.

Perimeter

Perimeter is the distance around the outside of a shape.

For example, if you want to know how much fencing you need to enclose your garden, you're measuring the perimeter of the garden.

Square



$$\text{Area} = \text{Side} \times \text{Side}$$

$$\text{Perimeter} = 4 \times \text{Side}$$

Rectangle



$$\text{Area} = \text{Length} \times \text{Width}$$

$$\text{Perimeter} = 2 \times (\text{Length} + \text{Width})$$

Circle



$$\text{Area} = \pi \times \text{Radius}^2$$

$$\text{Perimeter} = 2 \times \pi \times \text{Radius}$$

Triangle



$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$\text{Perimeter} = \text{Side1} + \text{Side2} + \text{Side3}$$

Parallelogram



$$\text{Area} = \text{Base} \times \text{Height}$$

$$\text{Perimeter} = 2 \times (\text{Base} + \text{Side})$$

Trapezoid

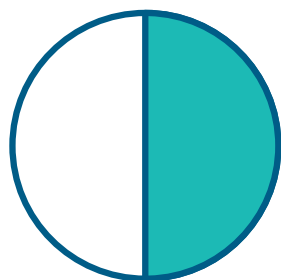


$$\text{Area} =$$

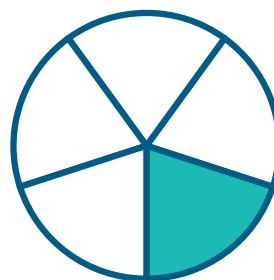
$$\frac{1}{2} \times (\text{Sum of parallel sides}) \times \text{Height}$$

$$\text{Perimeter} = \text{Sum of all four sides}$$

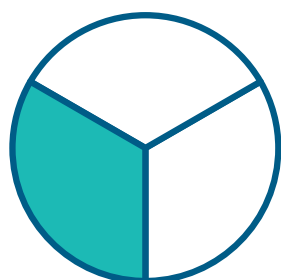
This is how we read fractions:



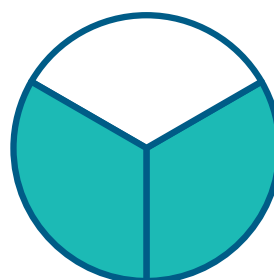
$\frac{1}{2}$: half / one half



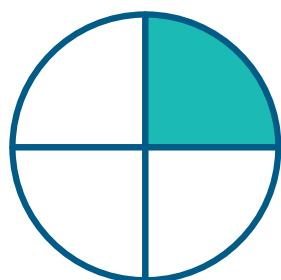
$\frac{1}{5}$: one fifth



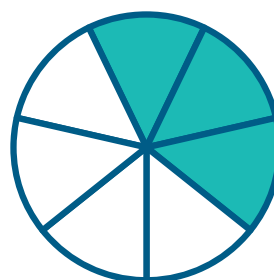
$\frac{1}{3}$: a third/ one third



$\frac{2}{3}$: two thirds




$\frac{1}{4}$: a quarter/ one quarter



$\frac{3}{7}$: three sevenths


This is how we read mathematical equations.



Addition

$$2 + 3 = 5$$


Two plus three equals five



Subtraction

$$8 - 4 = 2$$


Eight minus four equals two.



Multiplication

$$2 \times 3 = 6$$

Two times three equals six.
Two multiplied by three equals six.



Division

$$4 \div 2 = 2$$

Four divided by two equals two.

$$25 = 2 \times 2 \times 2 \times 2 \times 2 = 32$$

Two to the power of five equals thirty two.

$4^2 = 16$: Four squared equals sixteen

$4^3 = 64$: Four cubed equals sixty four

$$2 \times (\text{Length} + \text{Width})$$

Two times open parenthesis length plus width close parenthesis.

Two times the sum of the length and width.

$$\frac{1}{2} \times \text{Base} \times \text{Height}$$

one-half times base times height