

Grade 4 - Lines, Rays and Classifying Shapes - Lesson

Common Core 4.G.A.1, 4.G.A.2 · maths-pdf.fr/en/

A point is an exact spot. A line goes on forever in both directions, a ray has one endpoint and goes on forever one way, and a line segment has two endpoints. Lines can be parallel or perpendicular. Shapes are sorted by their parallel sides and by right, acute, or obtuse angles.

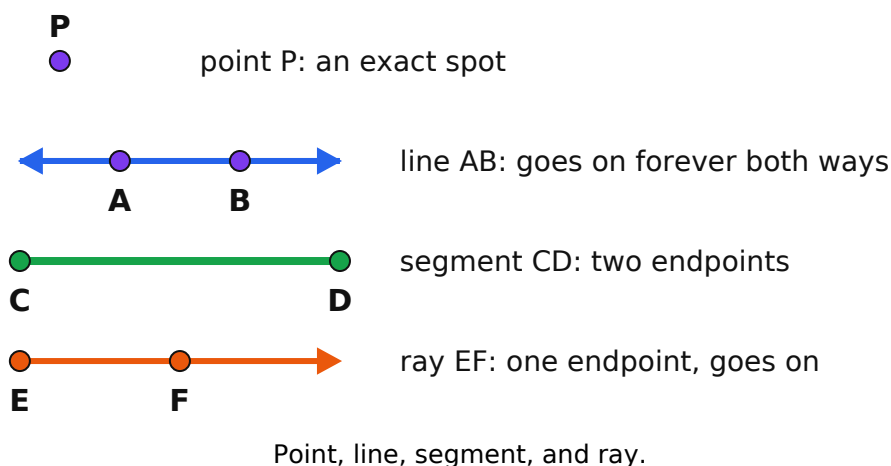
Grade 4 · Common Core State Standards: **4.G.A.1, 4.G.A.2**

Key facts

- A line segment has two endpoints; a ray has one; a line has none.
- Parallel lines never meet, and perpendicular lines meet at a right angle (90°).
- Right angles are 90° , acute angles are less than 90° , and obtuse angles are greater than 90° .
- A right triangle has exactly one right angle.
- Quadrilaterals are sorted by pairs of parallel sides and by right angles.

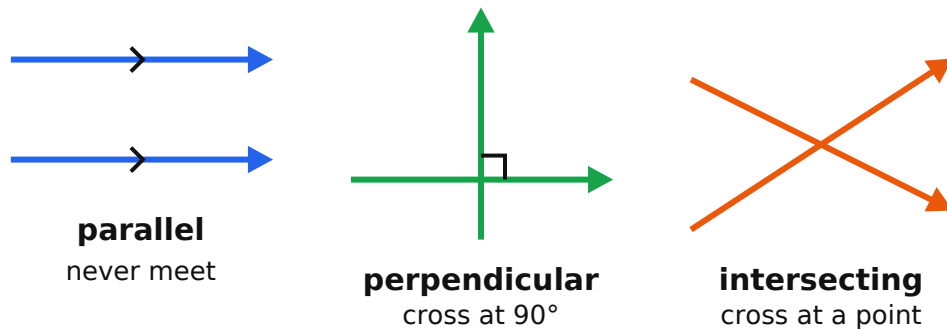
What are points, lines, rays, and segments?

Geometry starts with a few simple ideas. A **point** marks an exact place. A **line** is straight and never ends. A **ray** starts at one point and goes on forever in one direction. A **line segment** is a piece of a line with two endpoints, like a pencil drawn on paper.



What are parallel and perpendicular lines?

Look at two lines. If they stay the same distance apart and never meet, they are **parallel**, like the rails of a train track. If they meet and form a right angle, they are **perpendicular**, like the edges of a book corner.



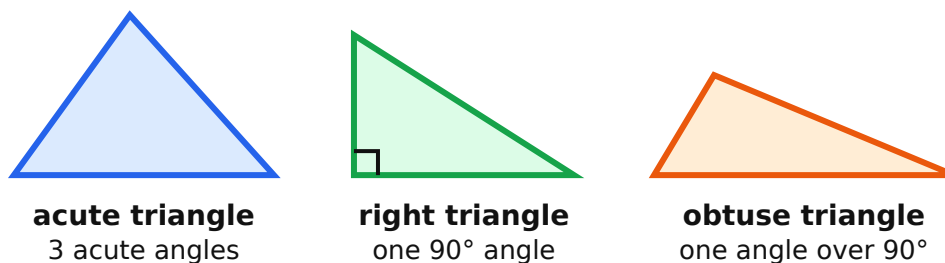
Parallel, perpendicular, and intersecting lines.

Angle names

A **right angle** measures exactly 90° . An **acute angle** is smaller than 90° . An **obtuse angle** is bigger than 90° but smaller than 180° .

How do you classify triangles?

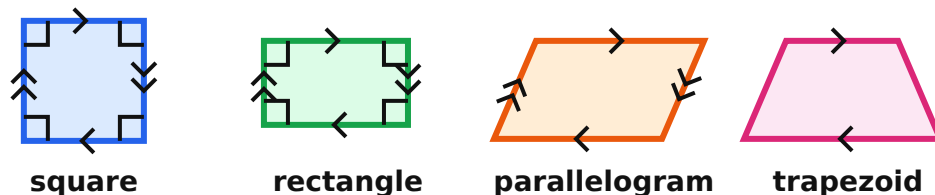
Look at the biggest angle of the triangle. If all three angles are acute, it is an acute triangle. If one angle is a right angle, it is a **right triangle**. If one angle is obtuse, it is an obtuse triangle. A triangle can have only one right or obtuse angle.



Triangles by their angles.

How do you classify quadrilaterals?

A quadrilateral has four sides. Count the pairs of parallel sides and the right angles. Little arrows mean sides are parallel, and a little square means a right angle.



Quadrilaterals. Little squares mark right angles and arrows mark parallel sides.

Example. Maya draws a shape with 4 sides, 2 pairs of parallel sides, and 4 right angles. What is it?

1. Four sides means it is a quadrilateral.
2. Two pairs of parallel sides means opposite sides are parallel.
3. Four right angles means it is a rectangle (a square if all sides are equal).

Questions about lines, rays and classifying shapes

What is the difference between a line, a ray, and a segment?

A line goes on forever in both directions. A ray has one endpoint and goes on forever in one direction. A line segment has two endpoints and a fixed length.

How can you tell if two lines are perpendicular?

Perpendicular lines meet at a right angle, which is exactly 90 degrees. You can check with the corner of a sheet of paper or with a protractor.

What is a right triangle?

A right triangle is a triangle with one right angle (90 degrees). The other two angles are both acute. The corner is often marked with a small square.

How many pairs of parallel sides does a parallelogram have?

A parallelogram has two pairs of parallel sides, because both pairs of opposite sides are parallel. A rectangle and a square are special parallelograms with four right angles.

Can a triangle have two right angles?

No. Two right angles would use up 180 degrees, and the third side could never close the triangle. A triangle has at most one right angle or one obtuse angle.