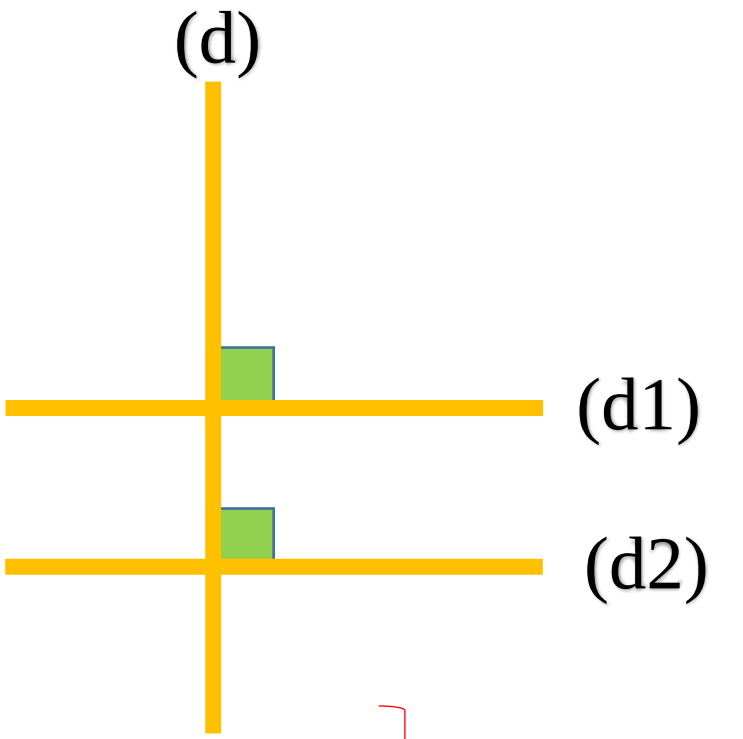
Revision Geometry

Parallel and perpendicular

Rule 1



(d1)//(d2)

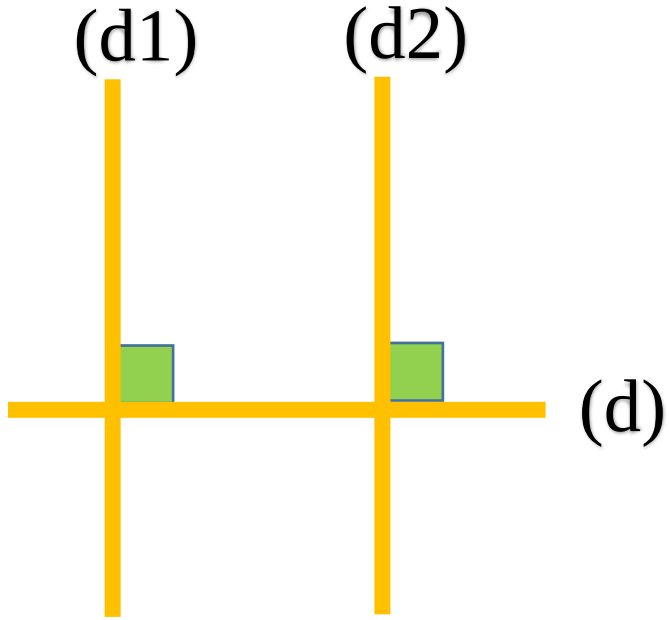
(d) ⊥ (d1)

} (d) ⊥ (d2)

(d1) // (d2)

(d) // (d1)

} (d) // (d2)



(d1) ⊥ (d)

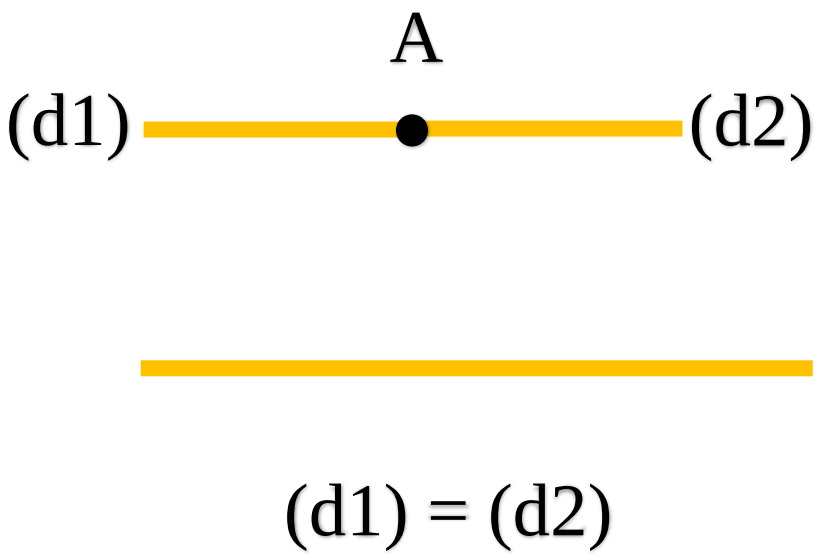
(d2) ⊥ (d)

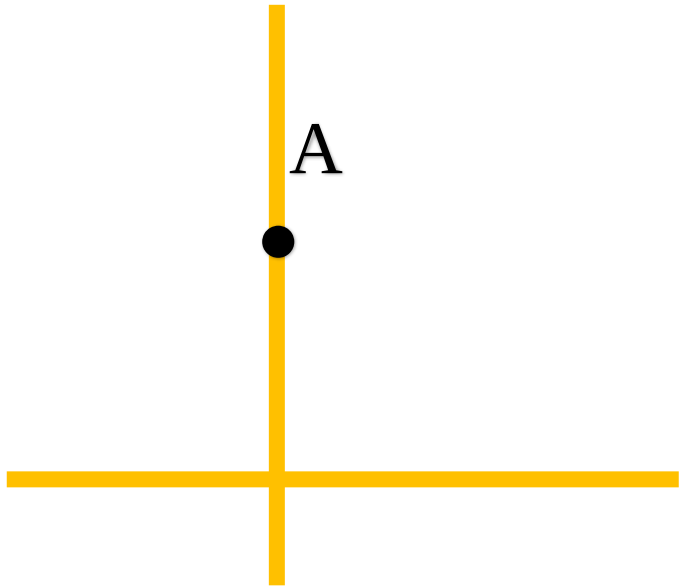
} (d1) // (d2)

Parallel and perpendicular

Rule 2

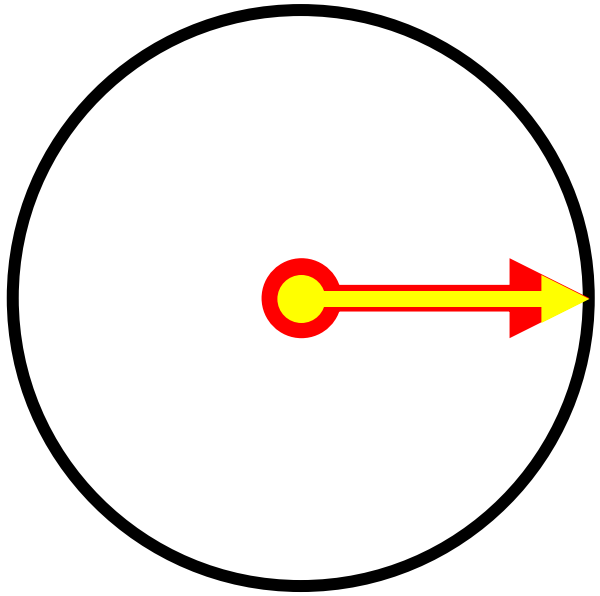
Through a given point we can draw only one parallel (perpendicular) line to a a given line.



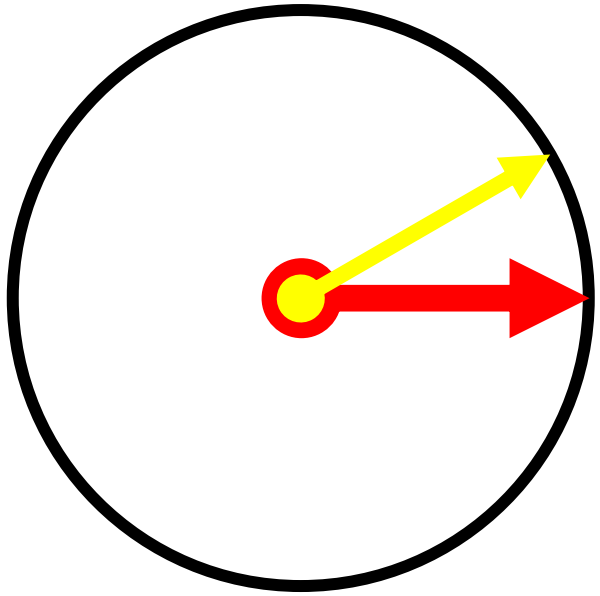


Angles

Null angle: 0°



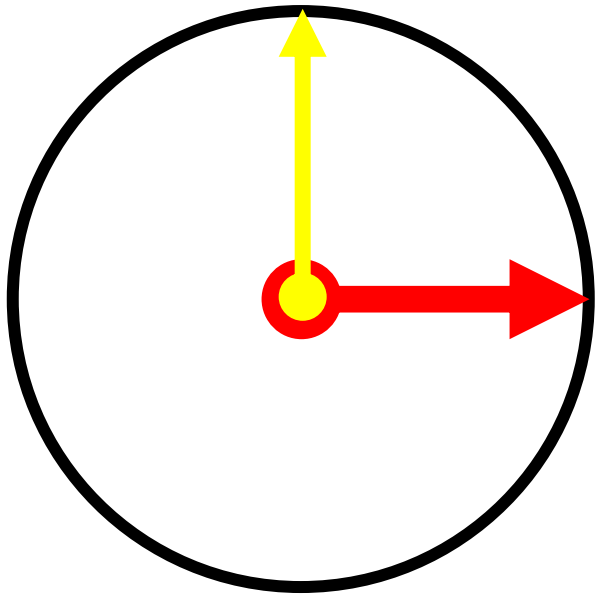
Angles



Null angle: 0°

Acute angle: between 0° and 90°

Angles

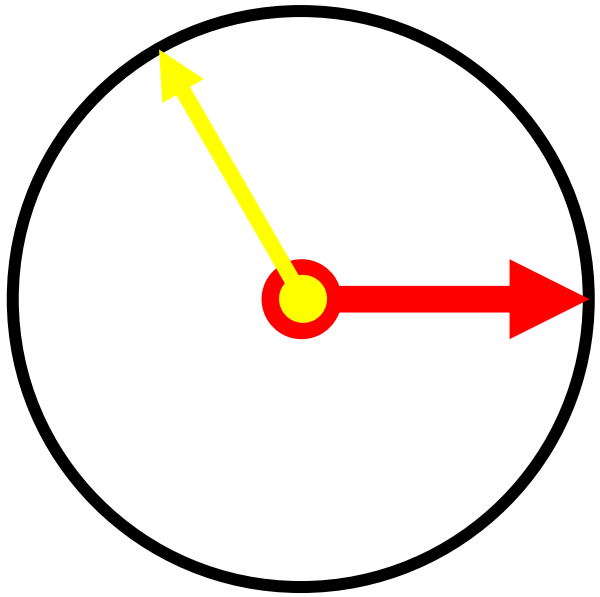


Null angle: 0°

Acute angle: between 0° and 90°

Right angle: 90°

Angles



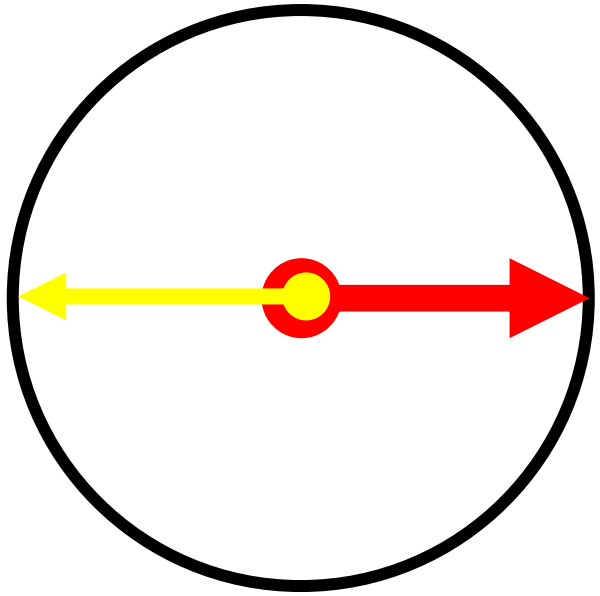
Null angle: 0°

Acute angle: between 0° and 90°

right angle: 90°

Obtuse angle: between 90° and 180°

Angles



Null angle: 0°

Acute angle: between 0° and 90°

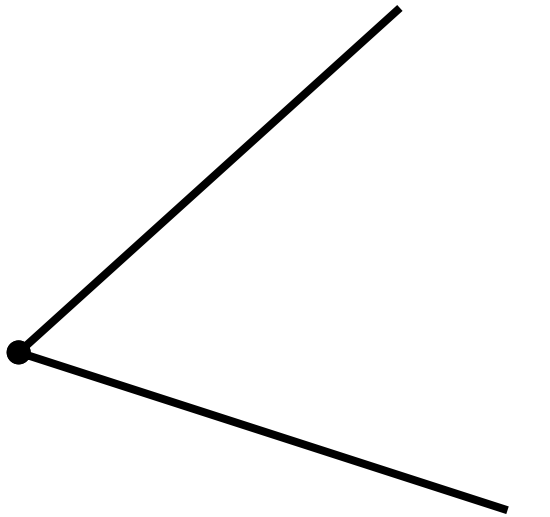
right angle: 90°

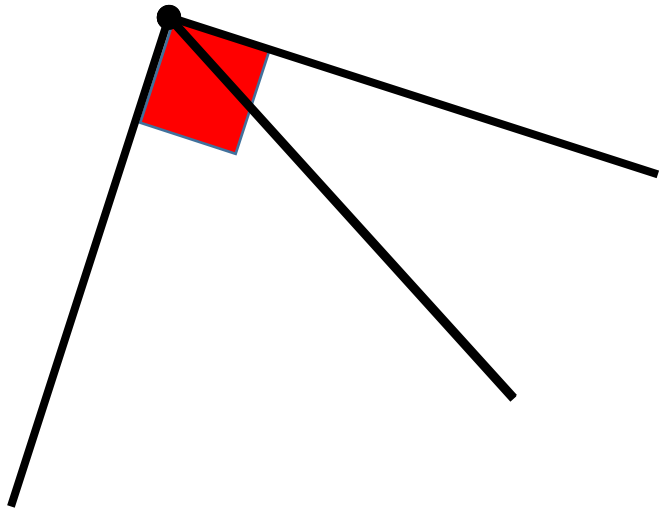
Obtuse angle: between 90° and 180°

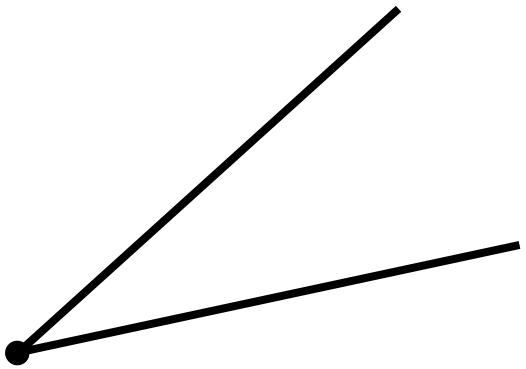
straight angle: 180°

Angles

Complementary angles





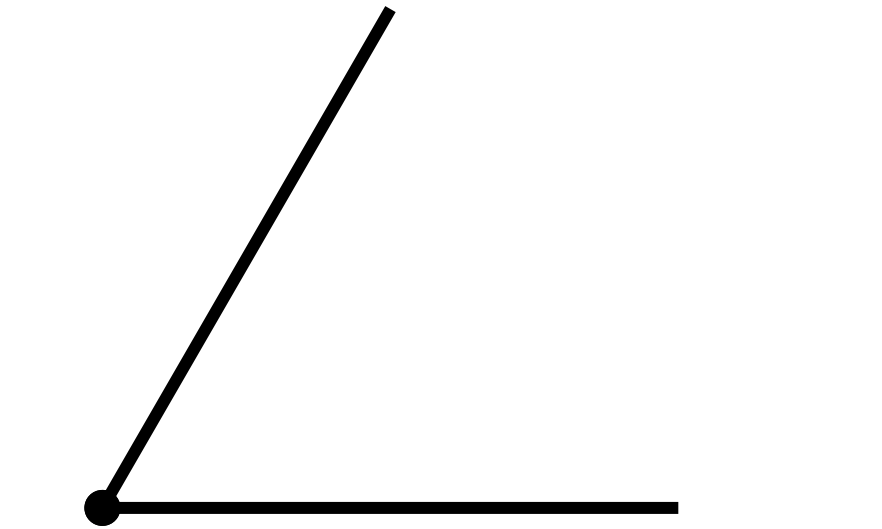


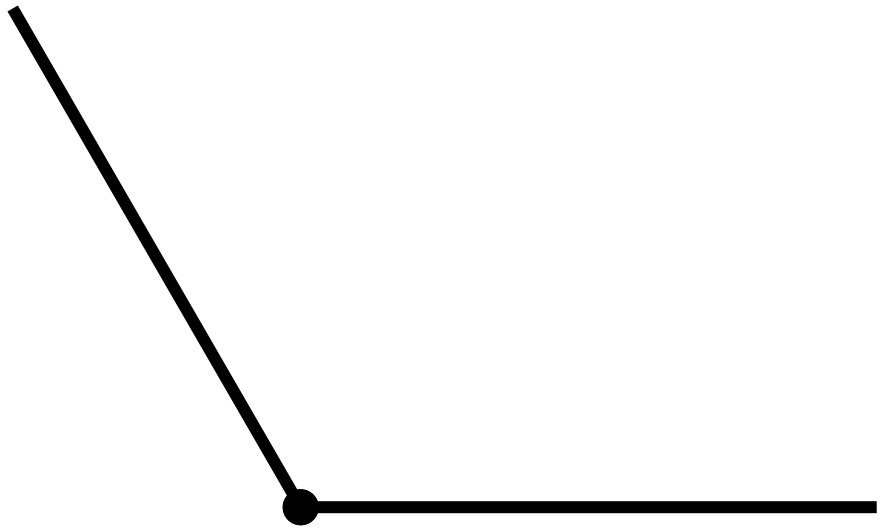
Sum of the angles is equal to 90◦.

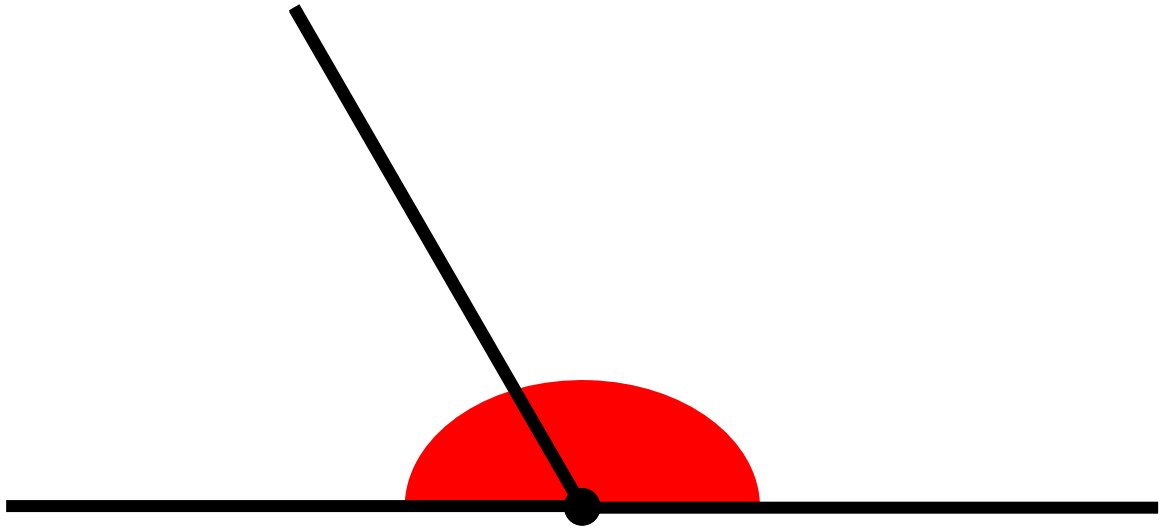
Each angle is called complement of the second angle.

Angles

Supplementary angles





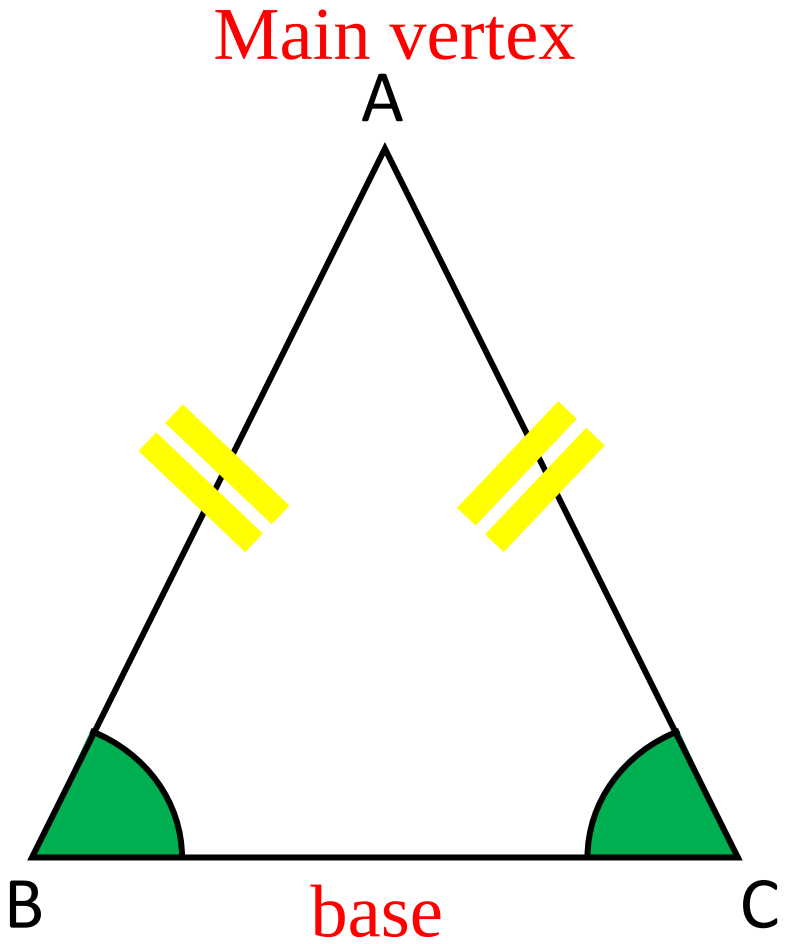


Sum of the angles is equal to 180◦.

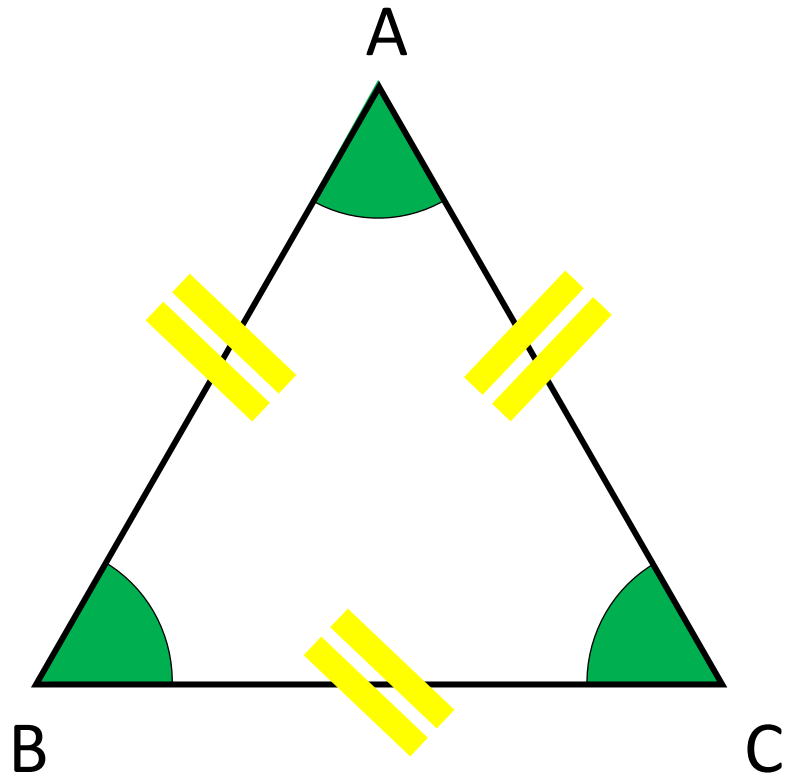
Each angle is called supplement of the second angle.

Triangles

Isosceles triangle



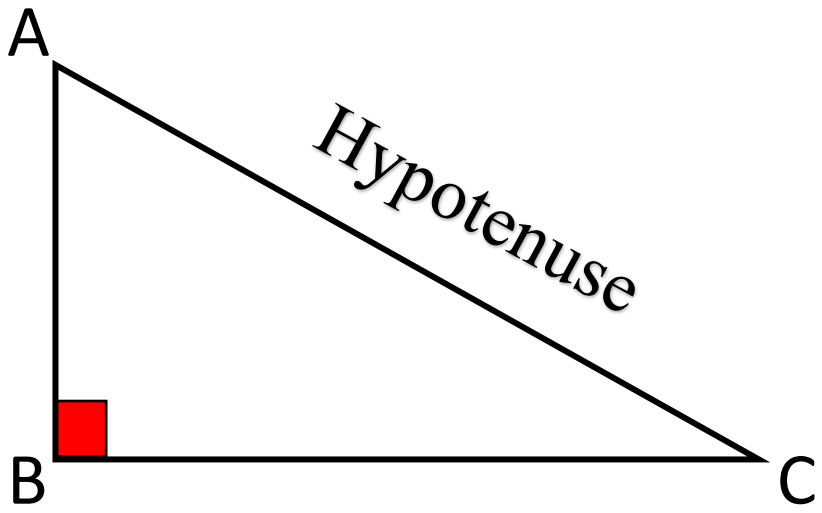
Equilateral triangle



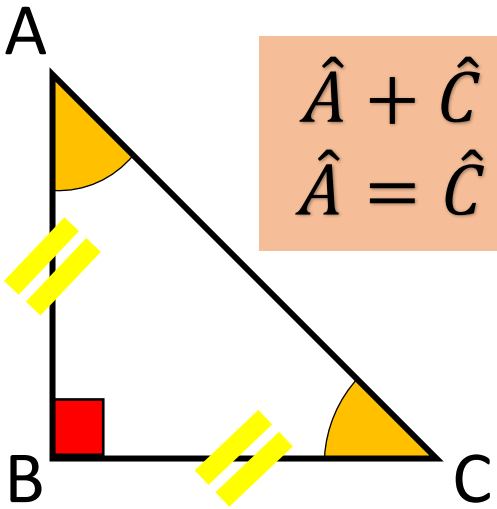
Triangles

Right triangle

$$\hat{A} + \hat{C} = 90°$$



Right isosceles triangle

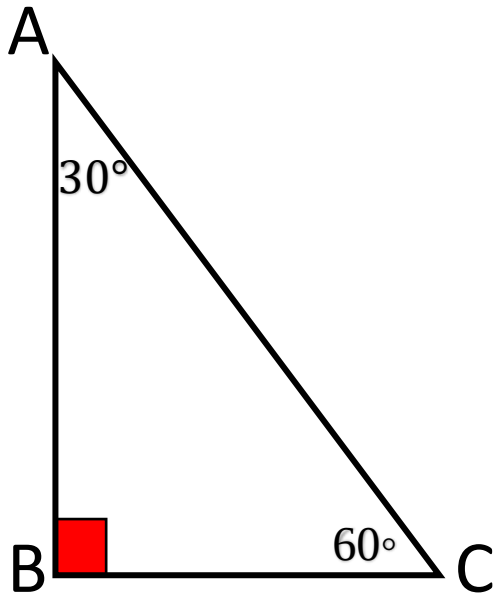


$$\hat{A} + \hat{C} = 90°$$
$$\hat{A} = \hat{C} = 45°$$

$$AC = AB\sqrt{2}$$
$$AB = \frac{AC}{\sqrt{2}}$$

Triangles

Semi equilateral triangle

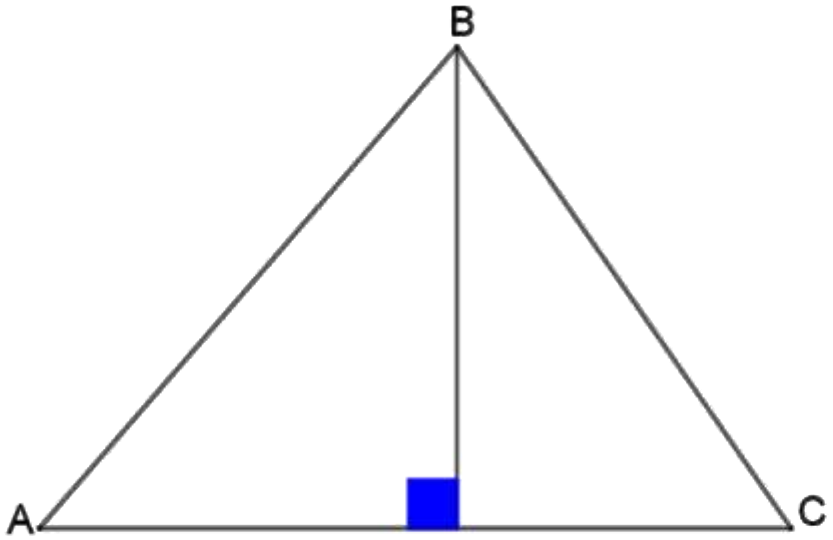


$$BC = \frac{hyp}{2} = \frac{AC}{2} \text{ (opposite to } 30\circ)$$

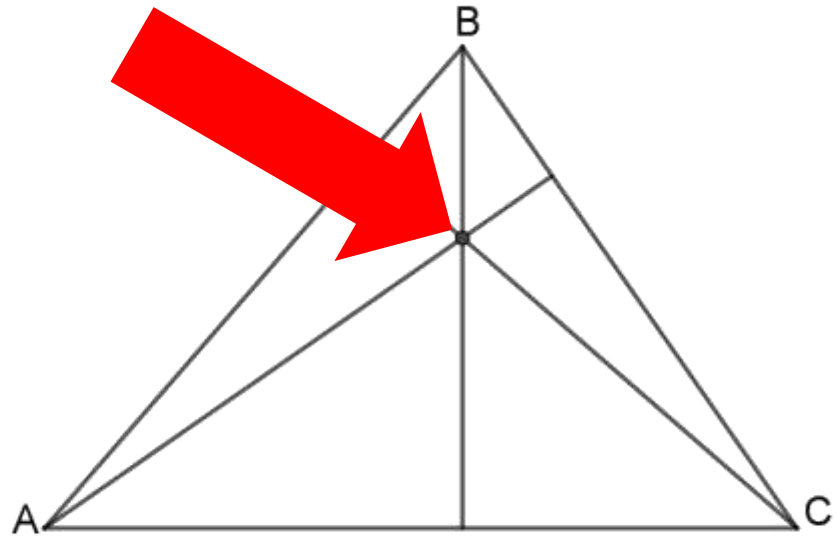
$$AB = \frac{hyp\sqrt{3}}{2} = \frac{AC\sqrt{3}}{2} \text{ (opposite to } 60\circ)$$

Remarkable lines in a triangle

Height (altitude)

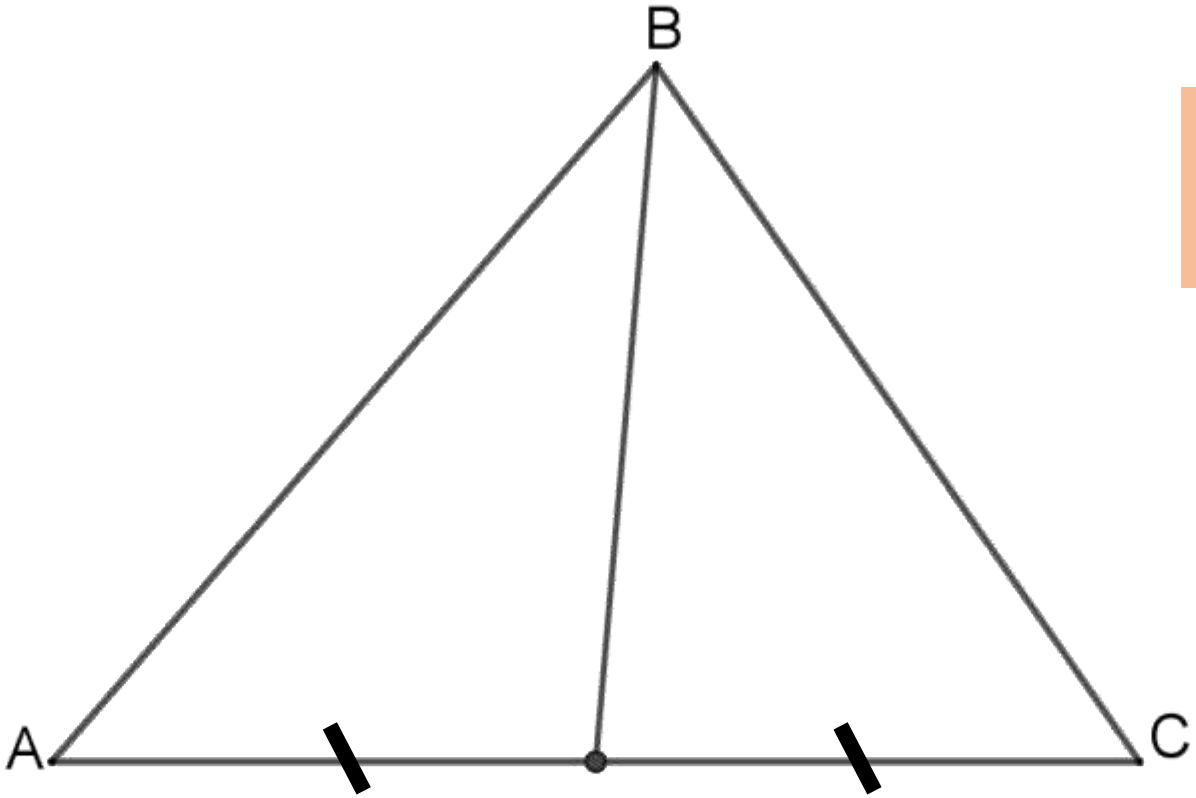


Orthocenter

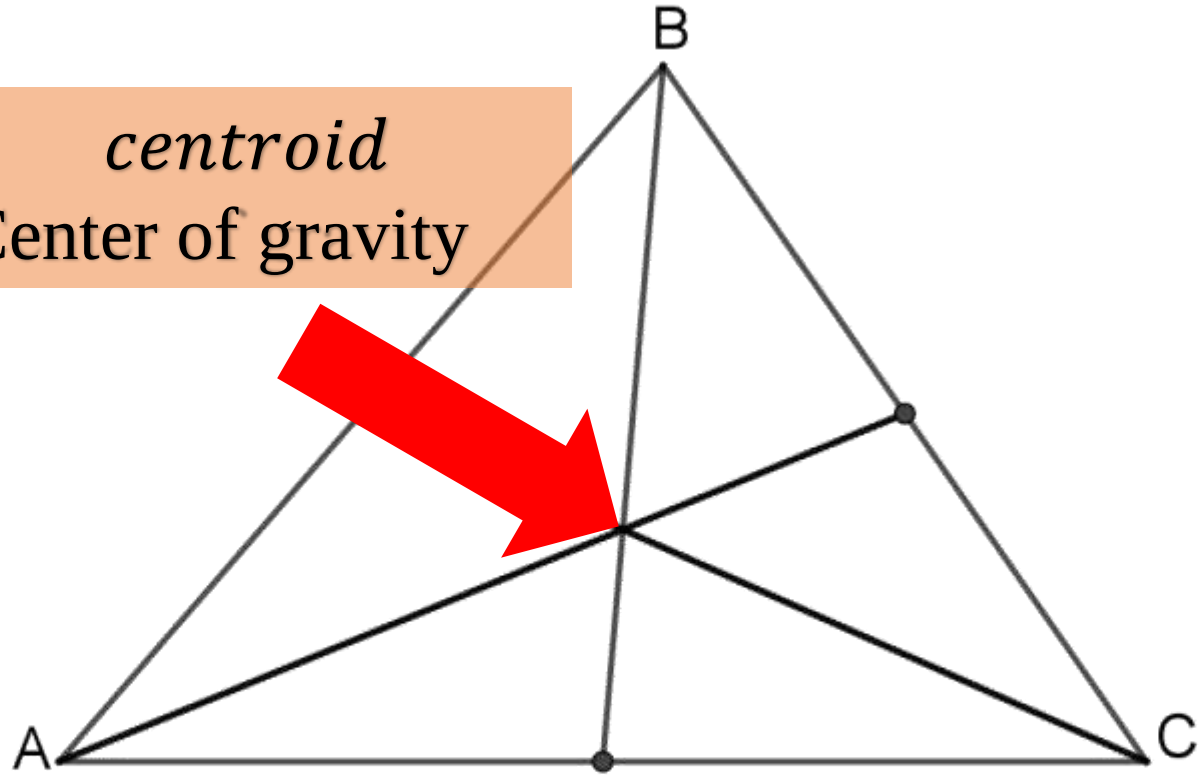


Remarkable lines in a triangle

Median



centroid
Center of gravity



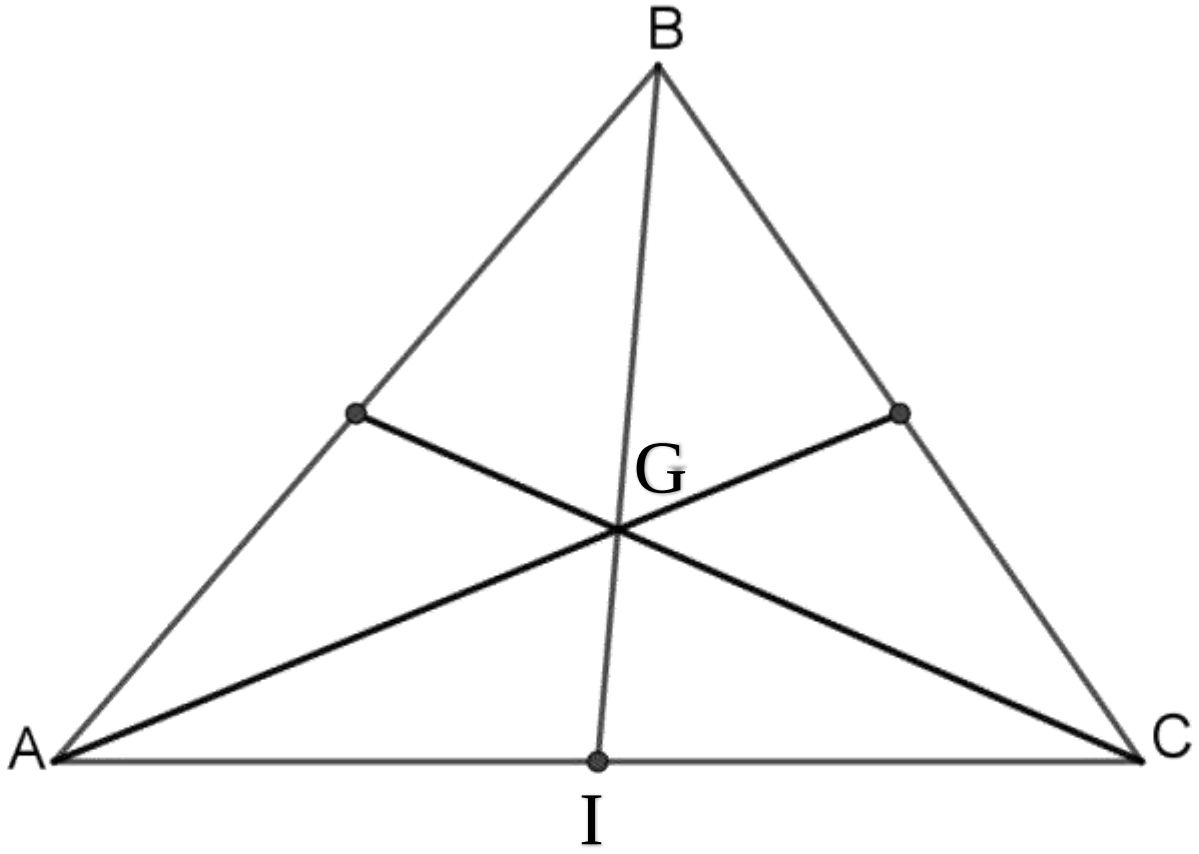
Remarkable lines in a triangle

Median

$$BG = \frac{2}{3}BI$$

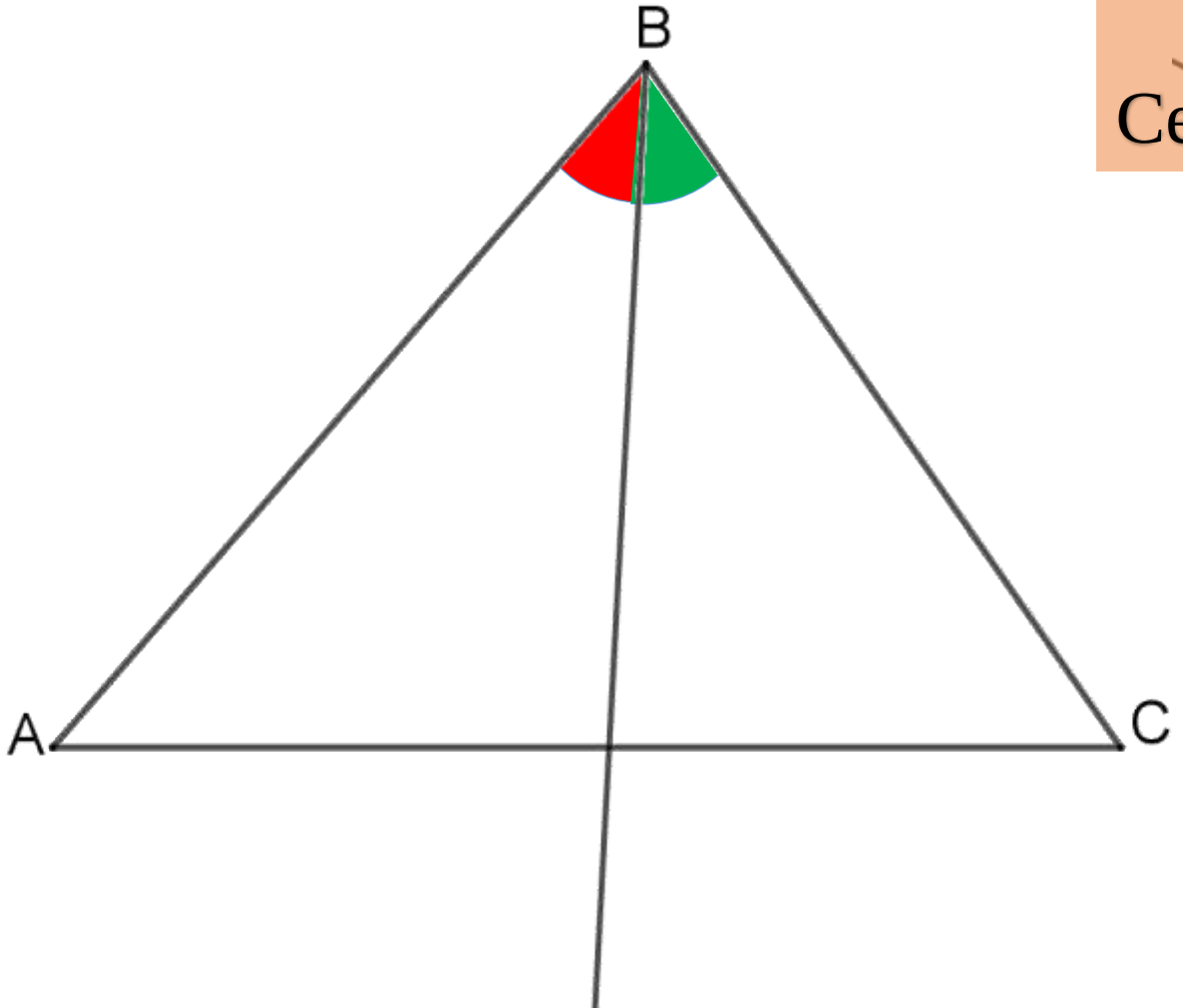
$$GI = \frac{1}{3}BI$$

$$BG = 2GI$$



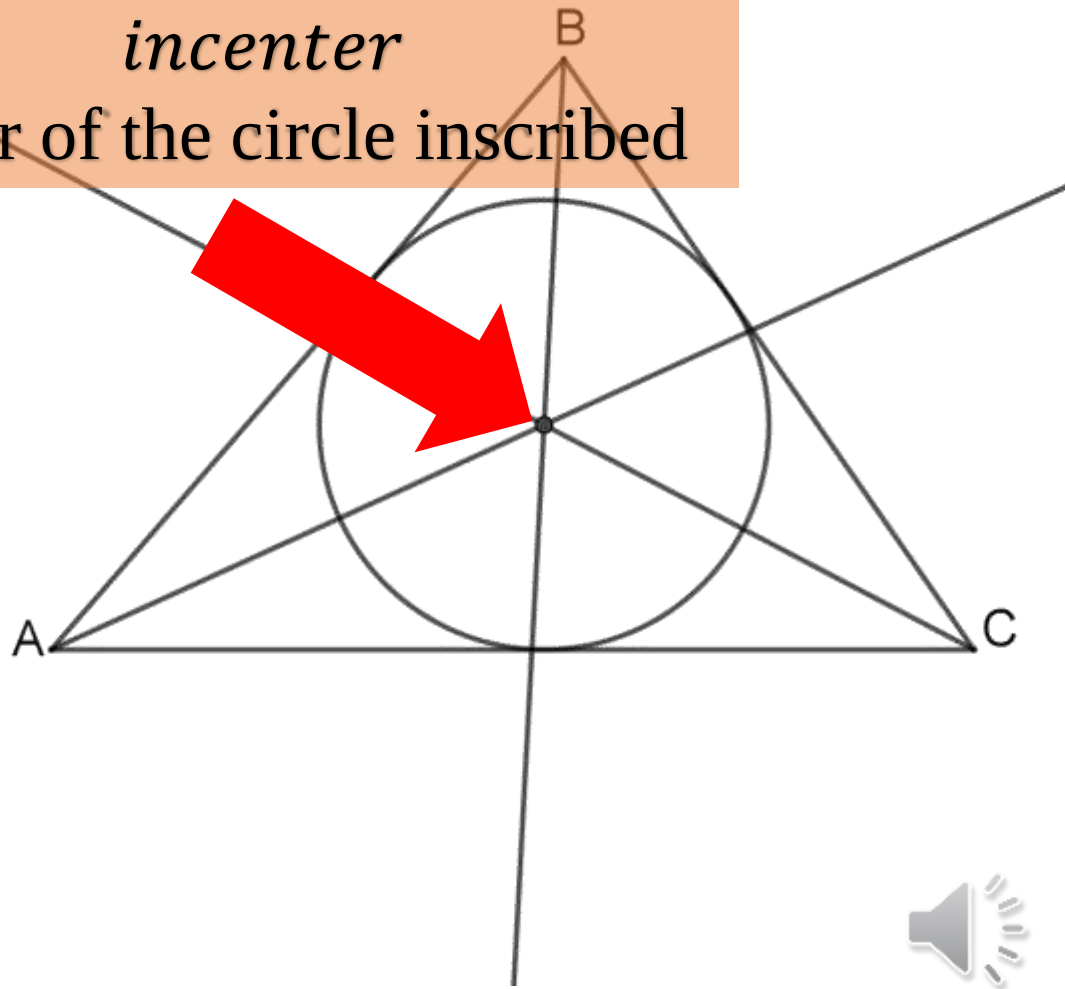
Remarkable lines in a triangle

Bisector



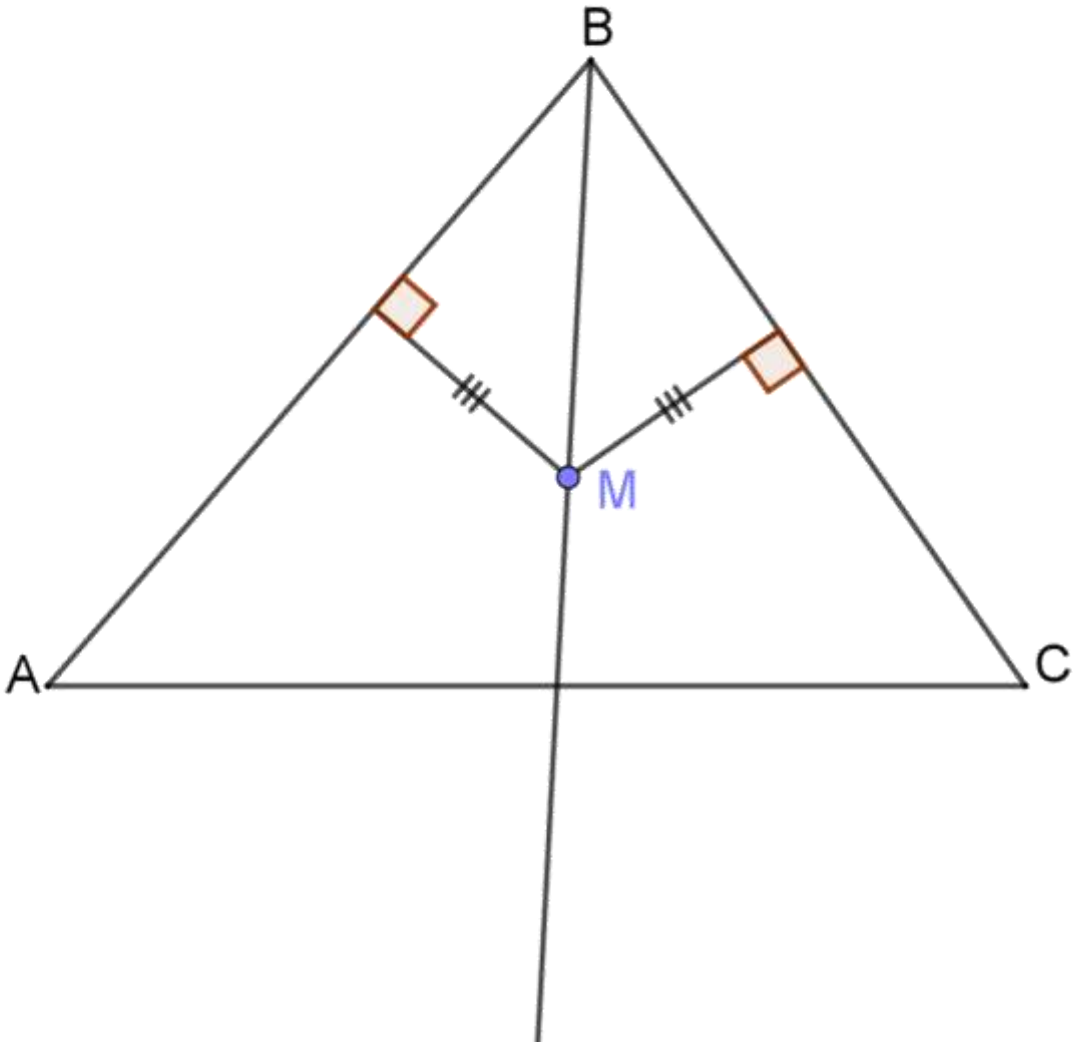
incenter

Center of the circle inscribed



Remarkable lines in a triangle

Bisector

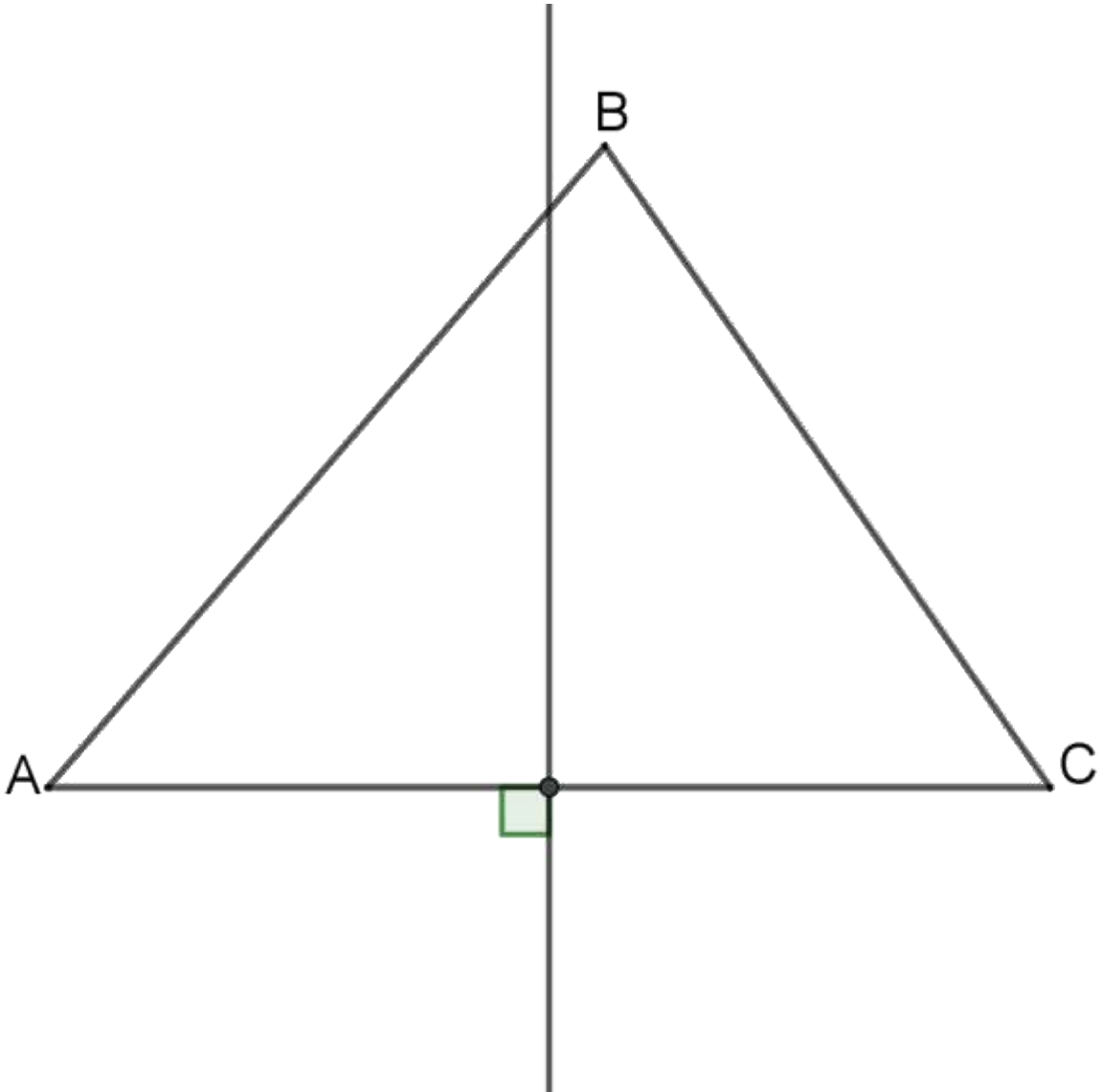


If M belongs to the bisector then, M is equidistant from the sides of the angle.

Conversely, if M is equidistant from the sides of the angle, then M belongs to the bisector of this angle.

Remarkable lines in a triangle

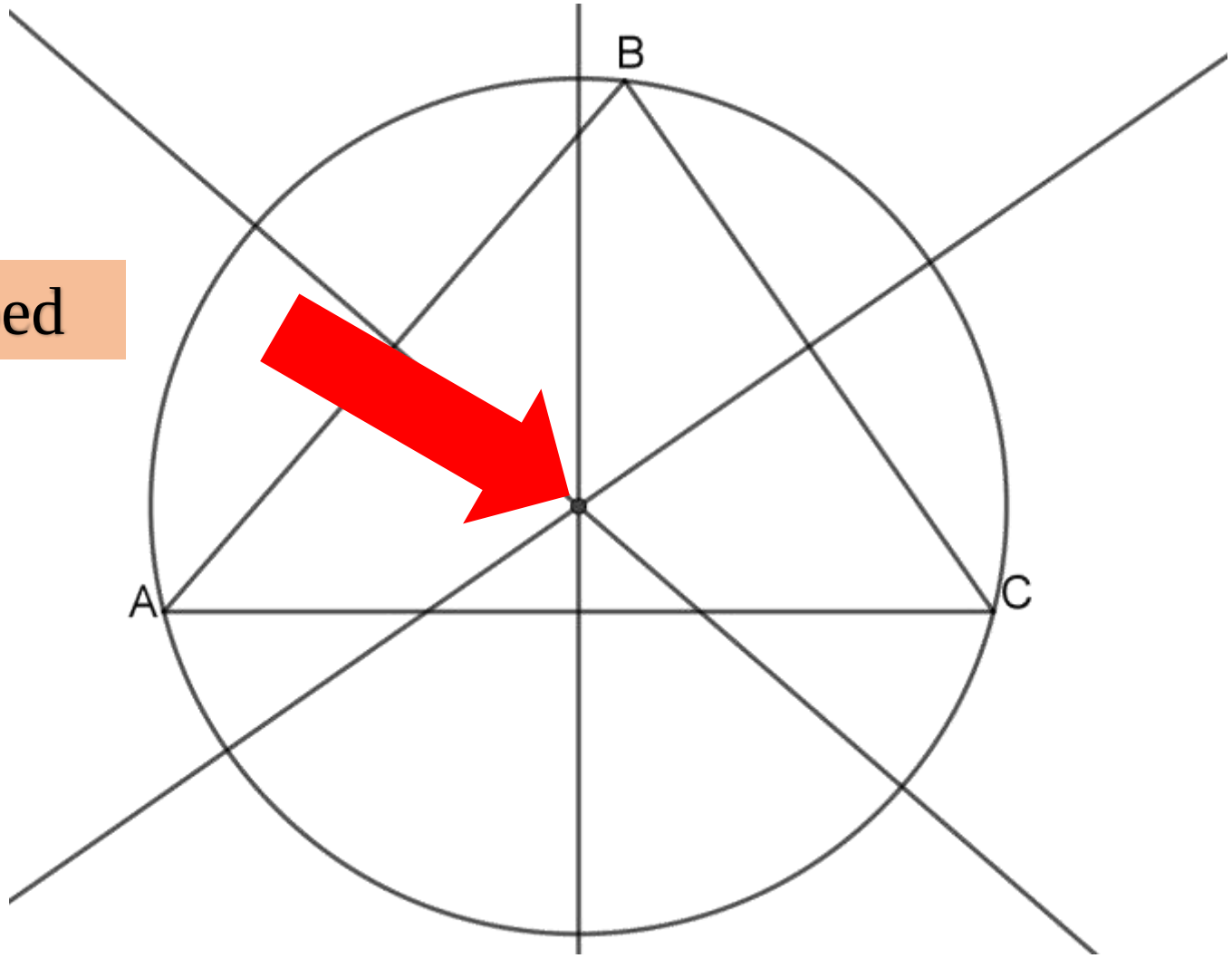
Perpendicular bisector



Remarkable lines in a triangle

Perpendicular bisector

Center of the circle circumscribed

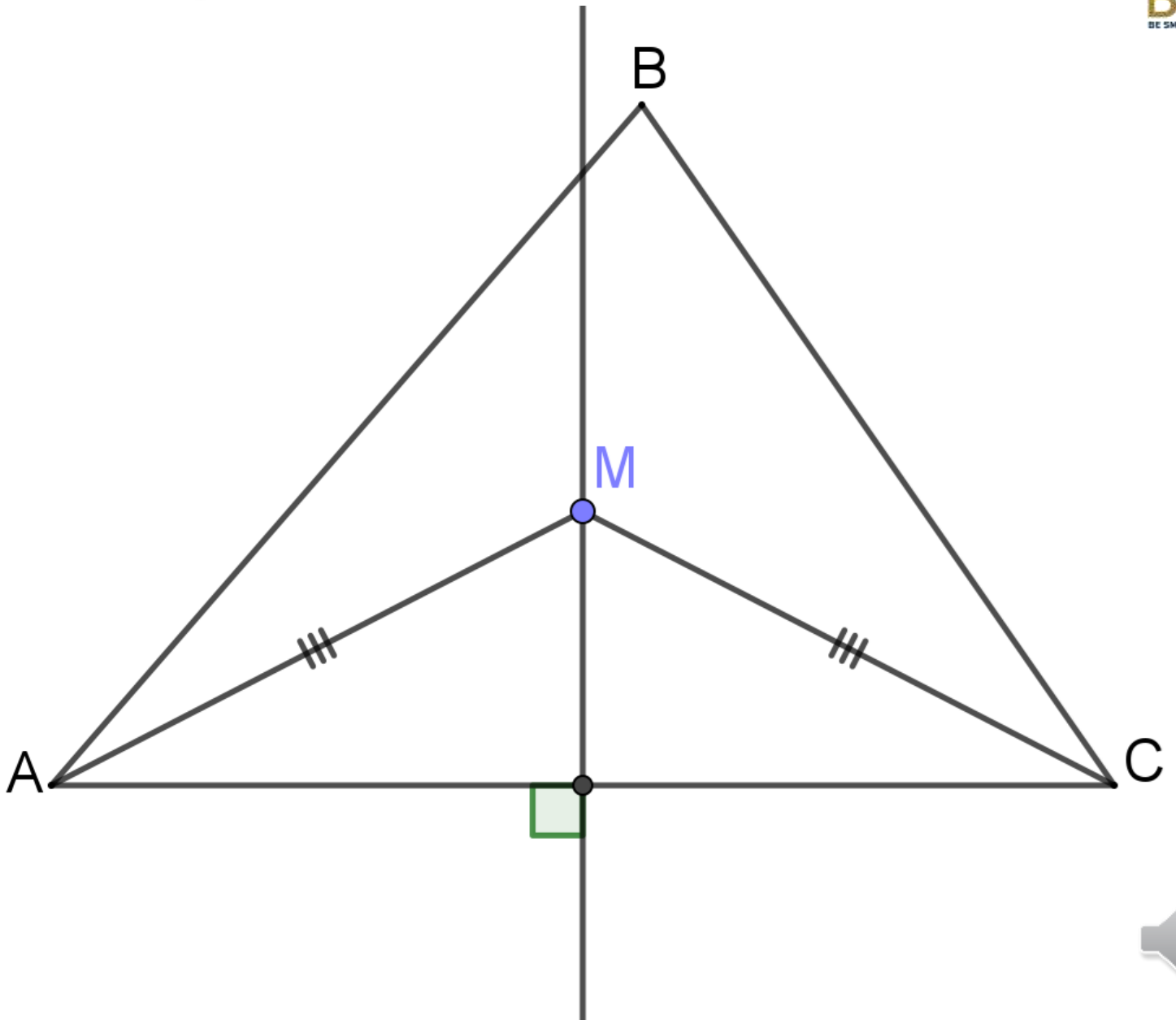


Remarkable lines in a triangle

Perpendicular bisector

Any point M on the perpendicular bisector of a segment is equidistant from the vertices of this segment.

Conversely, if any point equidistant from the vertices of a segment, then this point belongs to the perpendicular bisector of this segment.

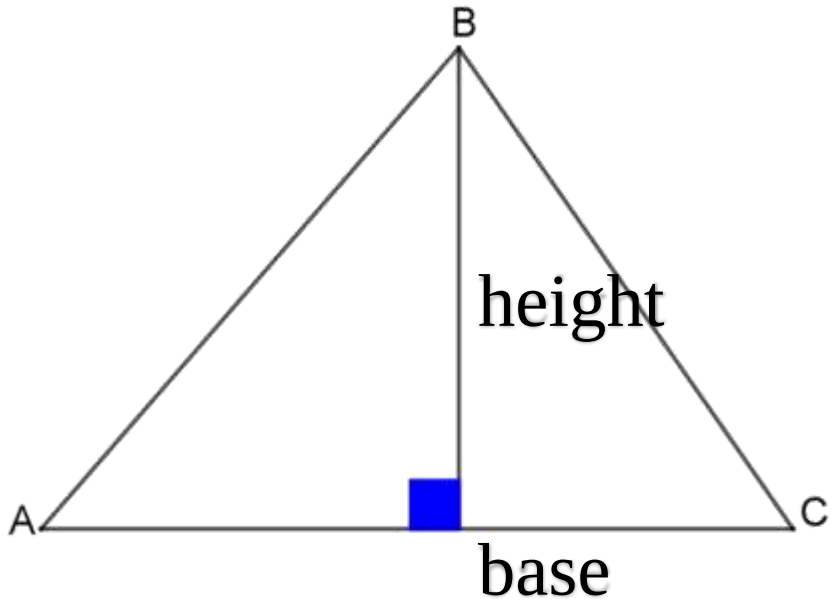


Perimeter and area

Triangle

$$P=S1+S2+S3$$

$$A=\frac{base \times height}{2}$$

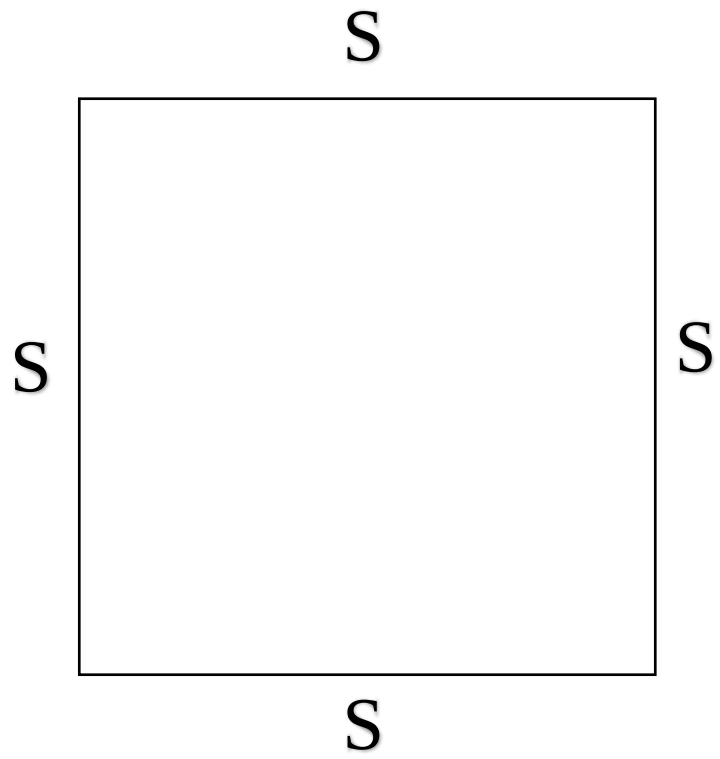


Perimeter and area

Square

$P=4\times S$

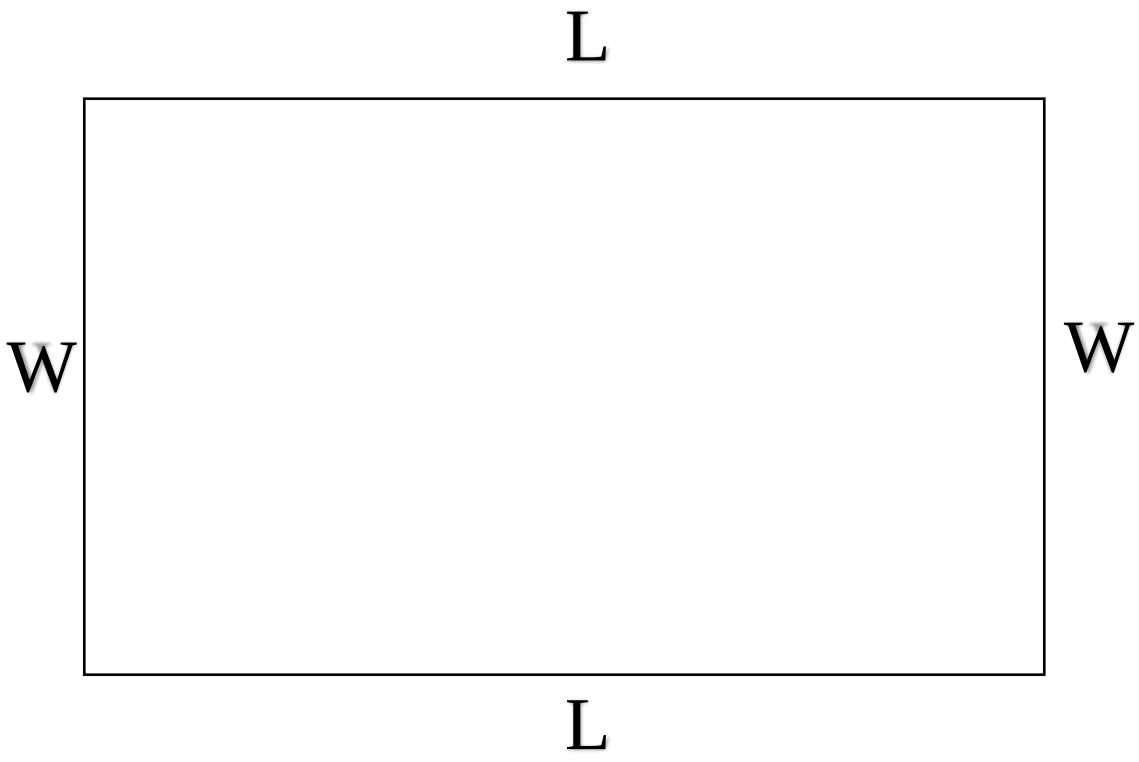
$A=S^2$



Perimeter and area

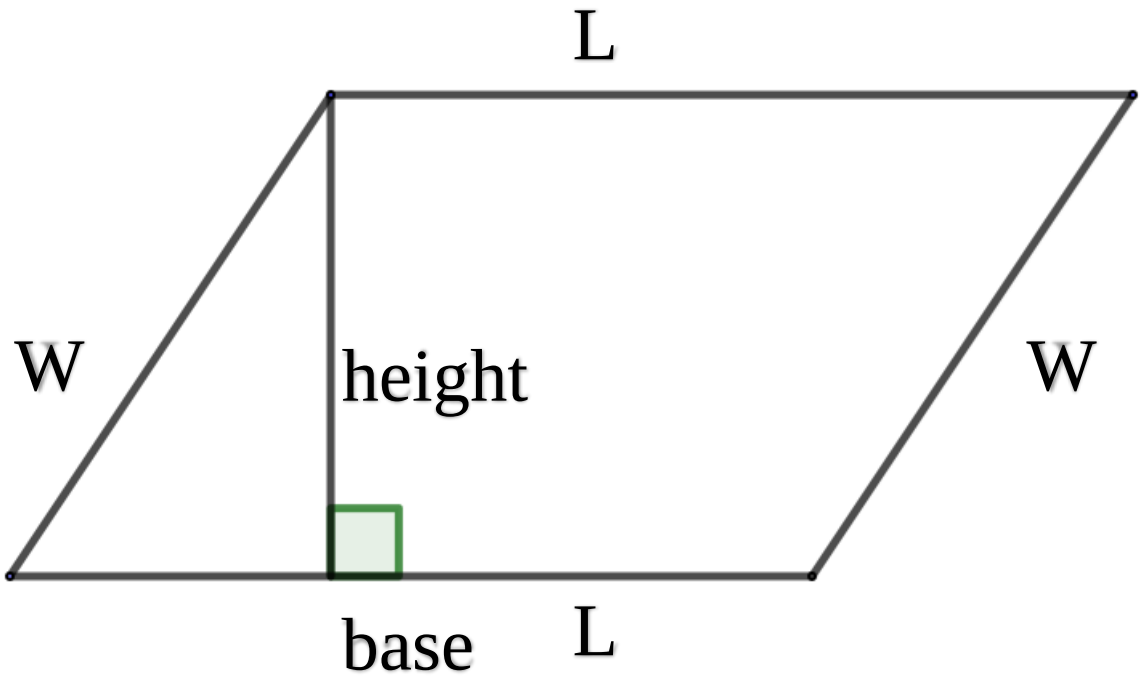
Rectangle

$P=2(L+W)$
$A=L\times W$



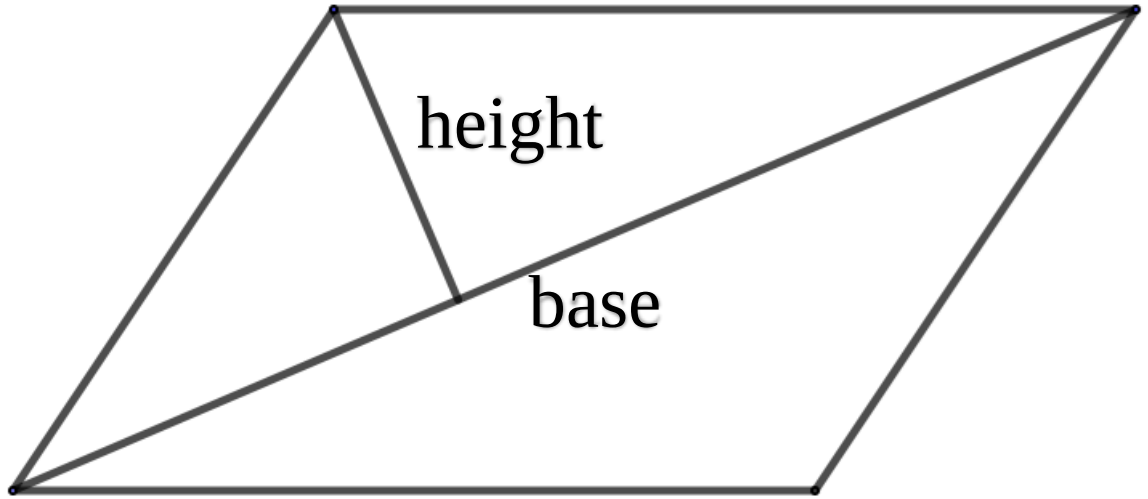
Perimeter and area

Parallelogram



$P=2(L+W)$

$A=base \times height$



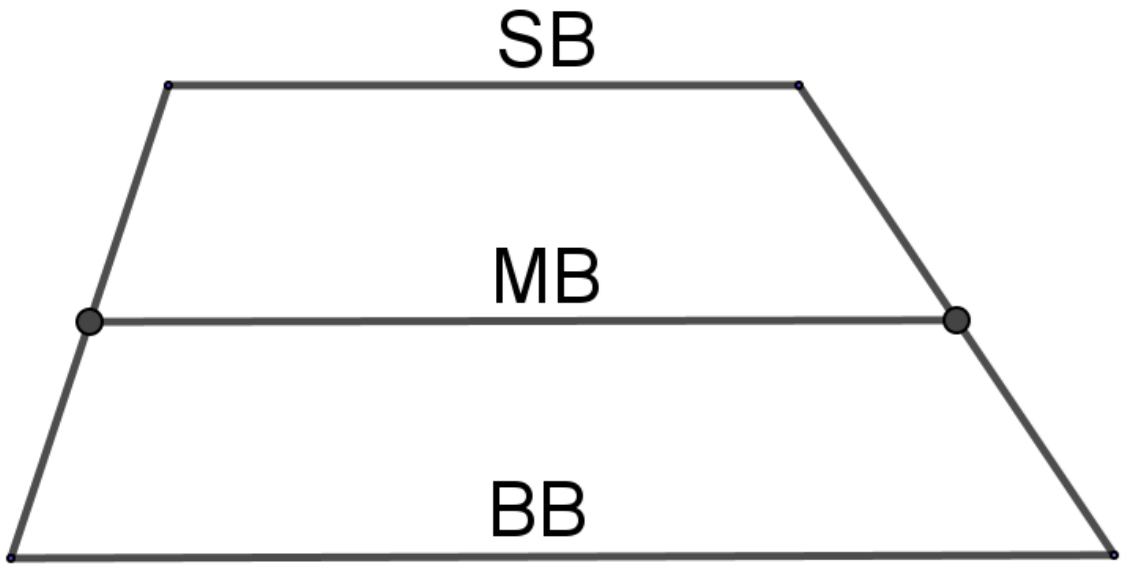
Perimeter and area

Trapezoid

$$MB = \frac{SB+BB}{2}$$

P=sum of sides

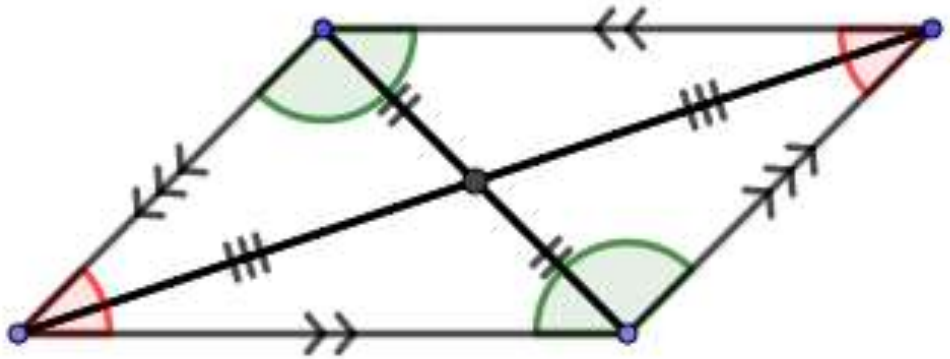
$$A=\frac{SB+BB}{2} \times height$$



Quadrilaterals

parallelogram

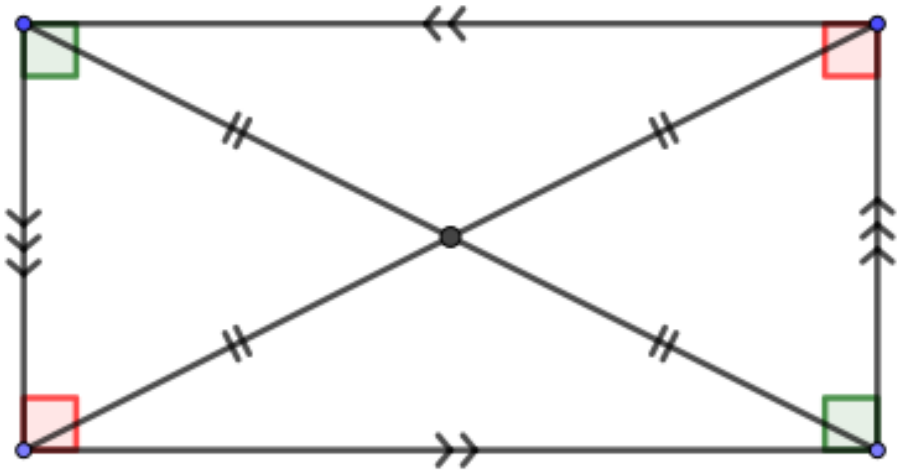
- Opposite sides are equal
- Opposite sides are parallel
- Diagonals bisect each other
- Opposite angles are equal.
- Adjacent angles are supplementary



Quadrilaterals

Rectangle

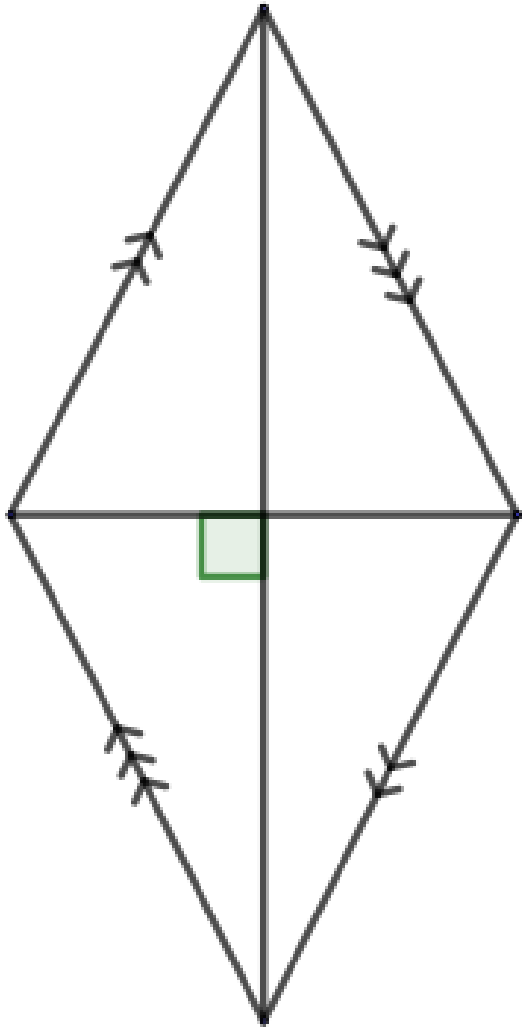
- Opposite sides are equal
- Opposite sides are parallel
- Diagonals bisect each other and equal
- 4 right angles



Quadrilaterals

Rhombus

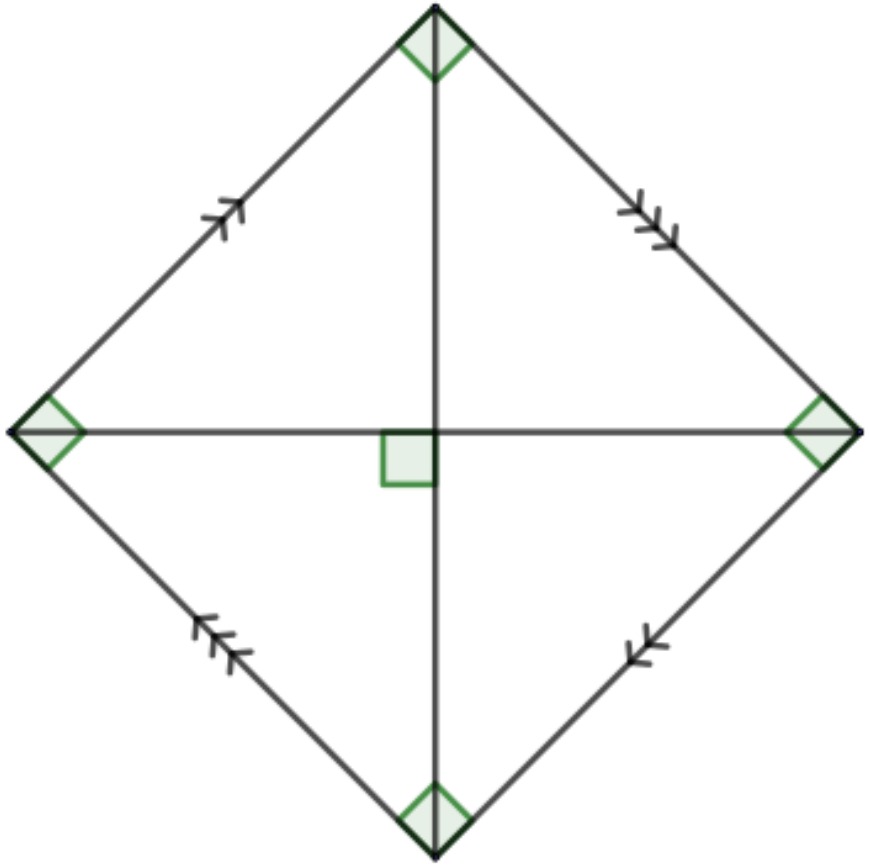
- 4 equal sides
- Opposite sides are parallel
- Diagonals bisect each other and perpendicular
- Diagonals are bisectors.
- Opposite angles are equal
- Adjacent angles are supplementary



Quadrilaterals

Square

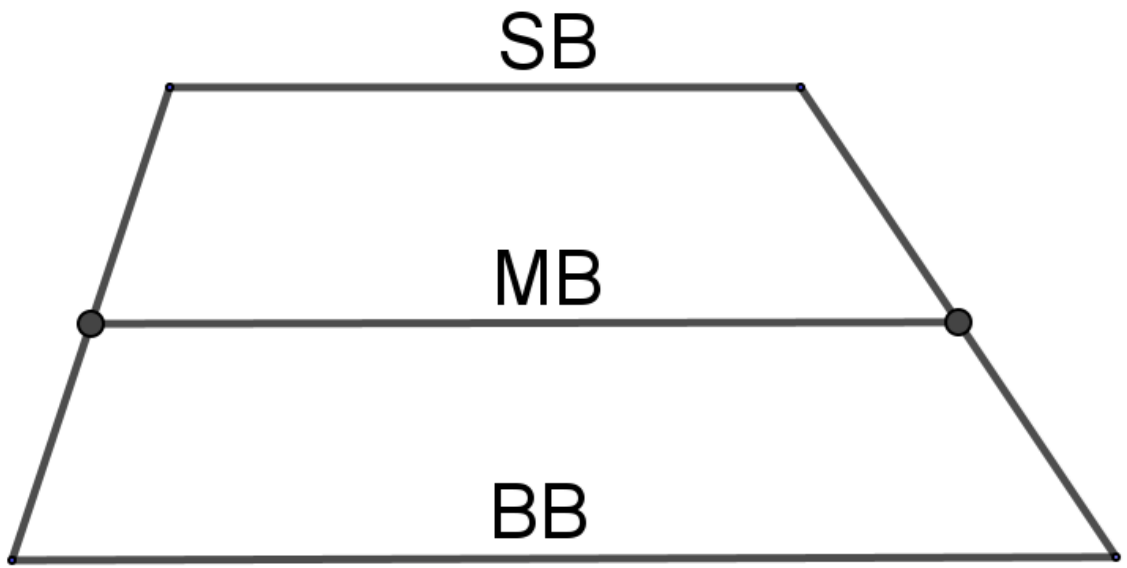
- 4 equal sides
- Opposite sides are parallel
- Diagonals bisect each other, equal and perpendicular.
- 4 right angles
- Diagonals are bisectors

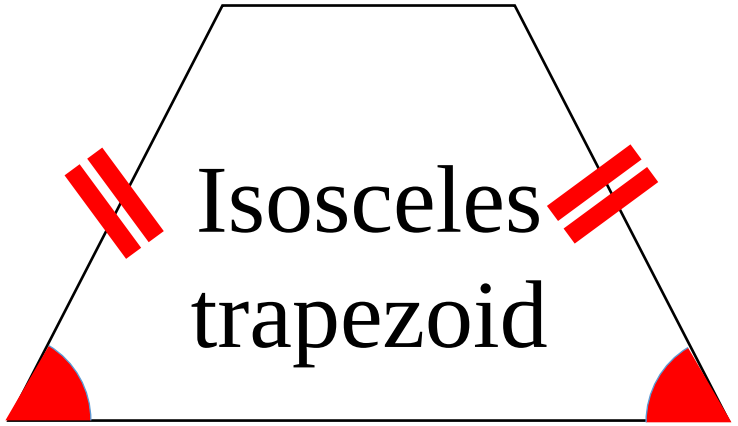


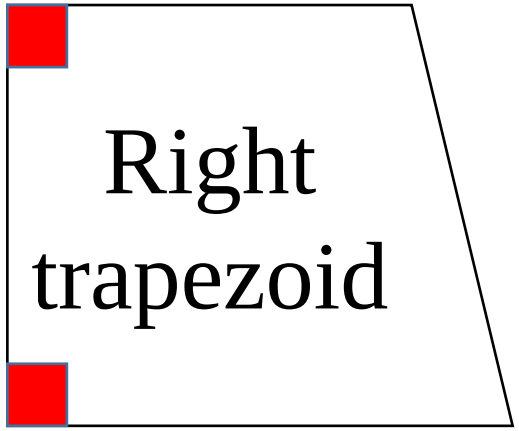
Quadrilaterals

Trapezoid

- Two opposite sides are parallel







Quadrilaterals

How to prove?

- Opposite sides are equal
- Opposite sides are parallel
- Two Opposite sides are parallel and equal
- Diagonals bisect each other

parallelogram

- Parallelogram+diagonals are perpendicular = rhombus
- Parallelogram+2 adjacent sides are equal = rhombus

  - Rhombus + 1right angle=square
  - Rhombus + equal diagonals=square

- Parallelogram+1 right angle= rectangle
- Parallelogram+equal diagonals= rectangle

  - Rectangle+2 adjacent equal sides=square
  - Rectangle+perpendicular diagonals=square