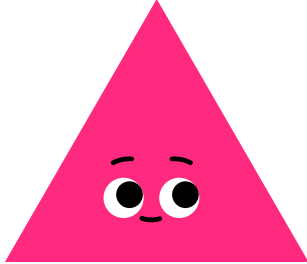
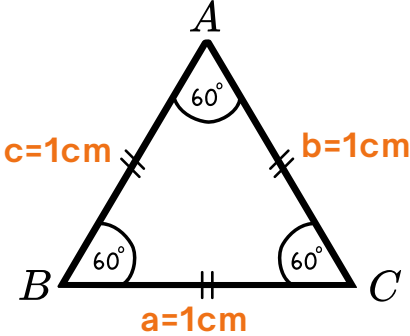
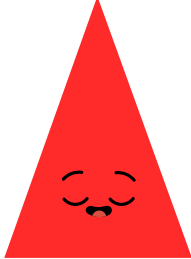
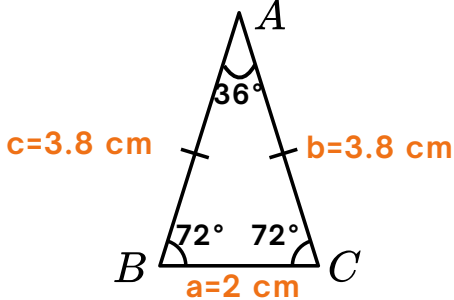
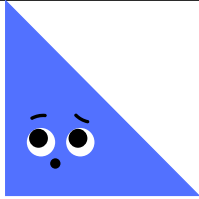
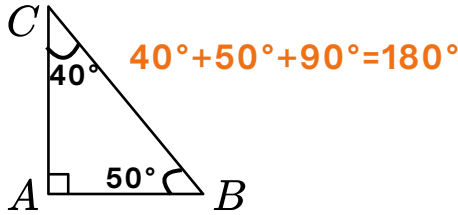
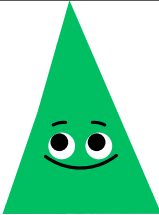
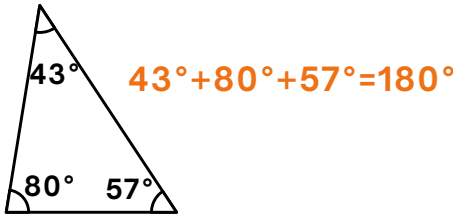
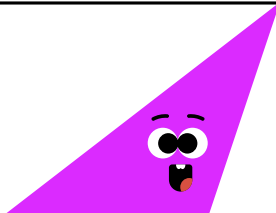
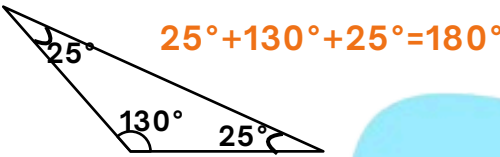
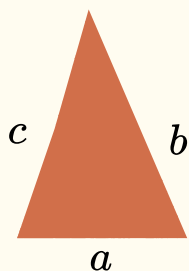


Triangle

Shape	Property	Example
 EQUILATERAL TRIANGLE	- All three sides are equal - Each angle equals 60° $a = b = c$ $\Downarrow$ $m\angle A = m\angle B = m\angle C = 60^\circ$	
 ISOSCELES TRIANGLE	- Two sides are equal - Two base angles are equal $b = c$ $\Downarrow$ $m\angle B = m\angle C$ $m\angle A = 180^\circ - 2m\angle B$ $= 180^\circ - 2m\angle C$ $m\angle B = m\angle C = \frac{180^\circ - m\angle A}{2}$	 $m\angle A = 180^\circ - 2m\angle B$ $= 180^\circ - 2m\angle C$ $= 180^\circ - 2 \times 72^\circ$ $= 36^\circ$ $m\angle B = m\angle C = \frac{180^\circ - m\angle A}{2}$ $= \frac{180^\circ - 36^\circ}{2}$ $= 72^\circ$
The sum of the interior angles of a triangle is 180° .		
 RIGHT TRIANGLE	One angle is exactly 90° $m\angle A = 90^\circ$ $\Rightarrow m\angle B + m\angle C = 90^\circ$ $(m\angle B + m\angle C = 180^\circ - m\angle A)$	
 ACUTE TRIANGLE	All three angles are less than 90° .	
 OBTUSE TRIANGLE	One of the angles is greater than 90° .	

**Triangle Inequality:**

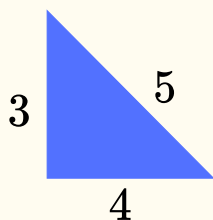
The sum of any two sides of a triangle is greater than the third side.

$$a + b > c, a + c > b, b + c > a$$

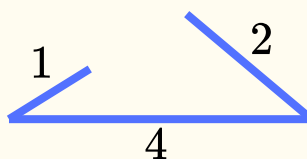
The difference of two sides is less than the third side.

$$c - a < b, c - b < a, b - c < a, b - a < c, a - b < c, a - c < b$$

- When 3 sides are given, we only need to check if the sum of 2 shorter sides is greater than 3rd side

**Example:**

$$3 + 4 > 5$$

**Example:**

$$1 + 2 \leq 4$$



If $a \geq b \geq c > 0$: $b + c > a$



valid triangle.

- ★ For each group, determine whether the three side lengths can form a triangle.

Group 1: $a = 13, b = 14, c = 15$

(A) Yes (B) No

Group 2: $a = 2, b = 5, c = 2$

(A) Yes (B) No

Group 3: $a = 8, b = 15, c = 7$

(A) Yes (B) No

Group 4: $a = 0.6, b = 1.2, c = 1.5$

(A) Yes (B) No

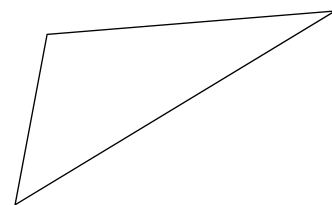
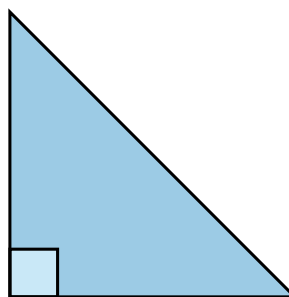
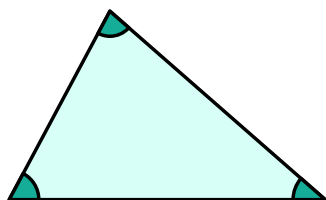
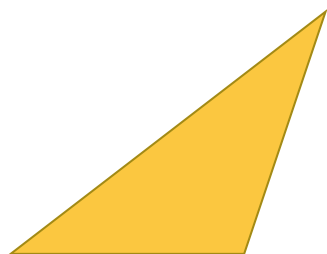
Group 5: $a = \frac{1}{2}, b = \frac{1}{6}, c = \frac{1}{3}$

(A) Yes (B) No

- ★ In a triangle, two sides have lengths 32 and 47. Choose the possible length(s) of the third side from the options below: _____

A. 10 B. 15 C. 23.5 D. 38 E. 62 F. 101

- ★ Match



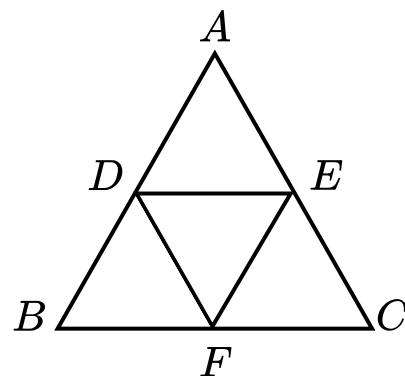
Acute triangle

Right triangle

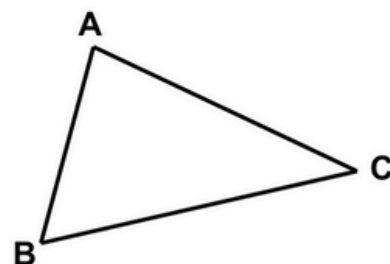
Obtuse triangle



- ★ $\triangle ABC$ is equilateral. Points D, E, and F are the midpoints of sides AB, AC, and BC, respectively. There are ___ equilateral triangles in the figure in total.

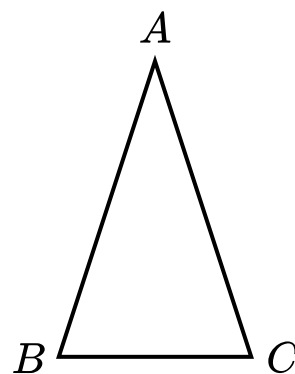


- ★ Given that $m\angle A = 86^\circ$ and $m\angle C = 39^\circ$, $m\angle B =$ _____ $^\circ$.



- ★ The perimeter of an isosceles triangle is 26 cm. The length of each equal side of the triangle is 10 cm long. The length of its base side is _____ cm.

- ★ Given that $AB = AC$ and $m\angle B = 2m\angle A$, $m\angle C =$ _____ $^\circ$.



Challenge

- ★ We have learned that the sum of the interior angles of a triangle is 180° .
 By dividing a quadrilateral into 2 triangles, we can find that the sum of its interior angles is $180^\circ \times 2 = 360^\circ$.
 By dividing a pentagon into 3 triangles, we can find that the sum of its interior angles is $180^\circ \times 3 = 540^\circ$.
 By dividing a hexagon into _____ triangles, we can find that the sum of its interior angles is _____ $^\circ$.
 By dividing an n -sided polygon into _____ triangles, we can find that the sum of its interior angles is _____ $^\circ$.

