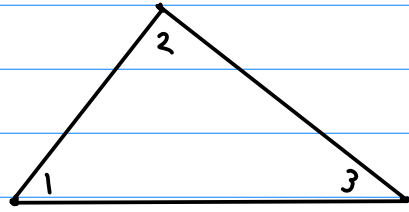


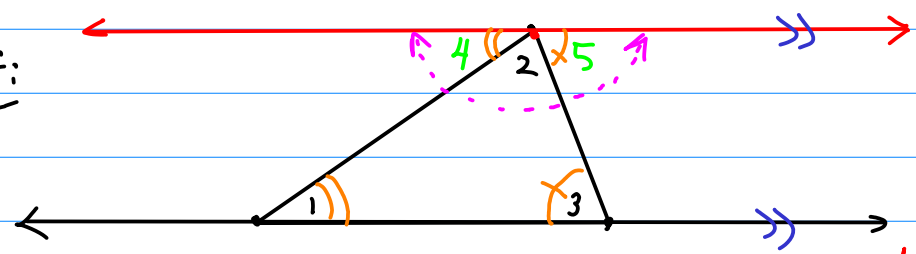
§4.1: △ Sum Conjecture

* △ Sum Conjecture: The sum of the measures of the \angle 's of a \triangle is 180° .



$$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$$

Proof:



$$m\angle 4 + m\angle 2 + m\angle 5 = 180^\circ$$

$$m\angle 4 = m\angle 1$$

(Alt. Int. \angle 's)

$$m\angle 5 = m\angle 3$$

(Alt. Int. \angle 's)

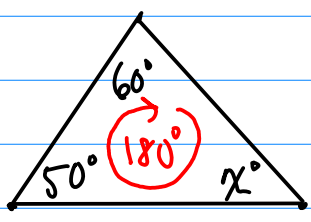
Substitution

$$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$$



Ex:

2 \angle 's of a \triangle measure 50° & 60° . Find the 3rd \angle .



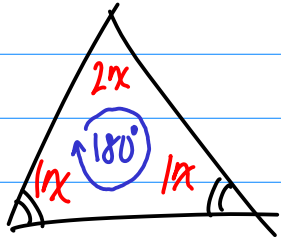
$$\begin{aligned} 50^\circ + 60^\circ + x^\circ &= 180^\circ \\ 110^\circ + x^\circ &= 180^\circ \\ -110^\circ &\quad -110^\circ \\ \hline x^\circ &= 70^\circ \end{aligned}$$

Steps

- ① Draw \triangle , label \angle 's
- ② Write eqn

$$1x:1x:2x$$

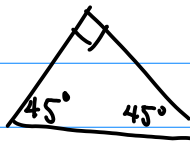
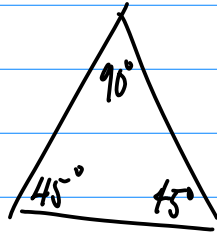
Ex: A Δ has \angle measures in ratio 1:1:2. Find the \angle measures.



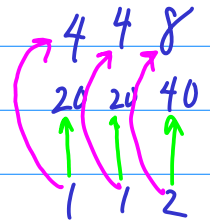
$$1x + 1x + 2x = 180^\circ$$

$$\frac{4x}{4} = \frac{180}{4}$$

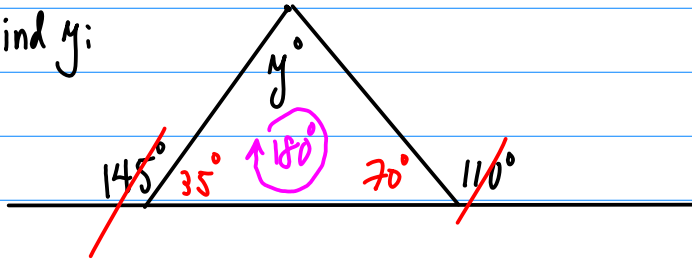
$$x = 45$$



Ages: 4 4 8



Ex: Find y :



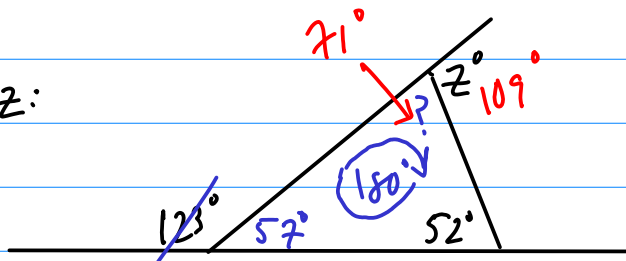
$$35^\circ + 70^\circ + y^\circ = 180^\circ$$

$$105^\circ + y^\circ = 180^\circ$$

$$-105^\circ \quad -105^\circ$$

$$y^\circ = 75^\circ$$

Ex: Find z :



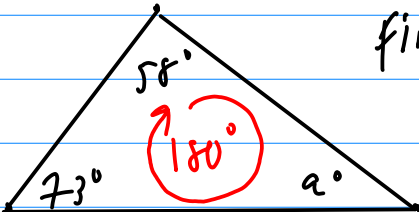
$$\begin{array}{r} 52 \\ + 57 \\ \hline 109 \end{array}$$

$$\begin{array}{r} 71 \\ - 109 \\ \hline 71 \end{array}$$

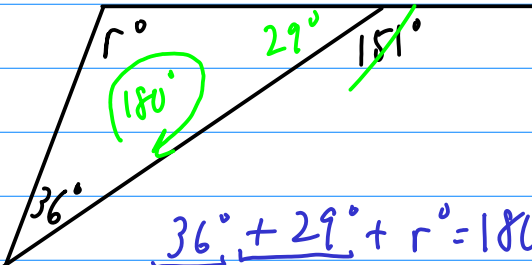
$$\begin{array}{r} 71 \\ - 180 \\ \hline -71 \\ \hline 109 \end{array}$$

$$z^\circ = 109^\circ$$

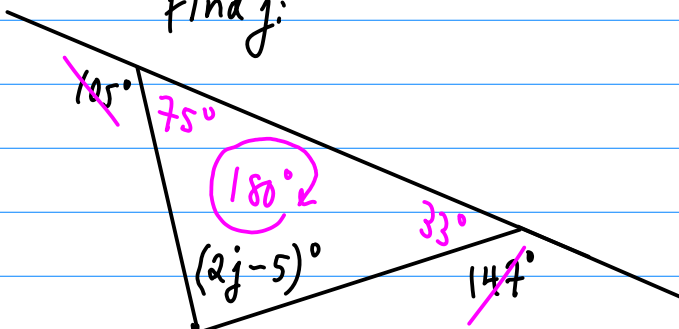
Practice Problems

1.  find a.

$$58^\circ + 73^\circ + a^\circ = 180^\circ$$

2.  find r:

$$\begin{array}{r} 36^\circ + 29^\circ + r^\circ = 180^\circ \\ 65^\circ + r^\circ = 180^\circ \\ -65^\circ \quad -65^\circ \\ \hline r^\circ = 115^\circ \end{array}$$

3.  find j:

$$75 + 33 + 2j - 5 = 180$$

$$\begin{array}{r} 103 + 2j = 180 \\ -103 \quad -103 \\ \hline 2j = 77 \end{array}$$

$$j = \frac{77}{2} = 38\frac{1}{2}^\circ$$