

Math 7
Unit 8 - Day 103

Name: _____

Triangles

Triangles are the most basic polygons. They have three sides.

The three angles of a triangle must add to 180°.

Triangle Inequality:

The lengths of the two shorter sides of a triangle must add to more than the length of the longest side.

<https://www.youtube.com/watch?v=7PflSEpPQns>

Can these be a triangle?

1) 2, 5, 6
Yes $2+5 > 6$

2) 3, 8, 12
No $3+8 < 12$

3) 2, 7, 9
No $2+7 = 9$

4) 20, 15, 34
Yes $20+15 > 34$

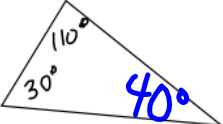
Give one example of each:

The sides form a triangle: 12, 6, 7

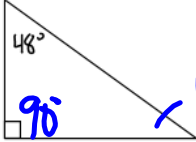
The sides do NOT form a triangle: 20, 5, 4

Angles of a triangle always add to 180°.

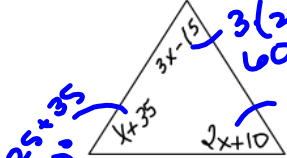
Find the missing angles:

1) 
$$\begin{array}{r} 110 \\ 30 \\ \hline 140 \end{array}$$

$$\begin{array}{r} 180 \\ -140 \\ \hline 40 \end{array}$$

2) 
$$\begin{array}{r} 90 \\ +48 \\ \hline 138 \end{array}$$

$$\begin{array}{r} 180 \\ -138 \\ \hline 42 \end{array}$$

3) Be sure to find all three angles!

$$x+35 + 3x-15 + 2x+10 = 180$$

$$6x + 30 = 180$$

$$\begin{array}{r} 6x + 30 = 180 \\ -30 \quad -30 \\ \hline 6x = 150 \\ \hline 6 \quad 6 \\ \hline x = 25 \end{array}$$

4) Find the largest angle of a triangle whose angles measure

$$3x + 7, 2x \text{ and } 16x + 5$$

$$3x + 7 + 2x + 16x + 5 = 180$$

$$\begin{array}{r} 21x + 12 = 180 \\ - 12 \quad - 12 \\ \hline 21x = 168 \\ \boxed{x = 8} \end{array}$$

$$\begin{array}{r} 3(8) + 7 = 31^\circ \\ 2(8) = 16^\circ \\ 16(8) + 5 = 133^\circ \\ \hline 180 \end{array}$$

5) Can these be triangles?

a) 6, 3, 5

yes

b) $60^\circ, 24^\circ, 92^\circ$

No

$$\begin{array}{r} 60 \\ 24 \\ 92 \\ \hline 176 \end{array}$$

c) 8, 2, 6

No

d) $122^\circ, 43^\circ, 15^\circ$

yes

$$\begin{array}{r} 122 \\ 43 \\ 15 \\ \hline 180 \end{array}$$