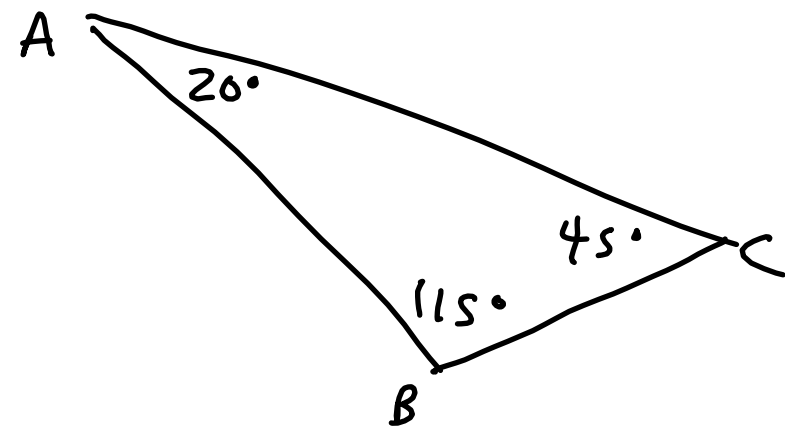


# Inequalities in Triangles

- One Triangle

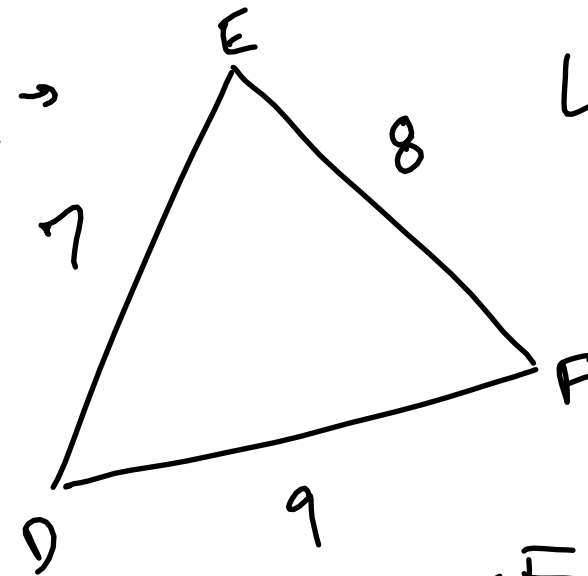
↳ In a triangle, the longest side of a triangle is across from the largest angle

EX → List sides from largest to smallest



$\overline{AC} \rightarrow \overline{AB} \rightarrow \overline{BC}$

EX →



List angles from smallest to largest

$\angle F \rightarrow \angle D \rightarrow \angle E$

# - Triangle Inequality Theorem

↳ The sum of the lengths of any 2 sides of a triangle is greater than the length of the 3rd side

EX → What possible range of values could 3rd side of triangle have?

1) 5, 6

Smallest

$$x + \underset{-5}{5} > \underset{-5}{6}$$

$$x > 1$$

Biggest

$$5 + 6 > x$$

$$x < 11$$

2) 4, 7

$$\text{diff} < x < \text{sum}$$

$$3 < x < 11$$

3) 10, 12

$$\text{diff} < x < \text{sum}$$

$$2 < x < 22$$

4) 13, 13

$$0 < x < 26$$

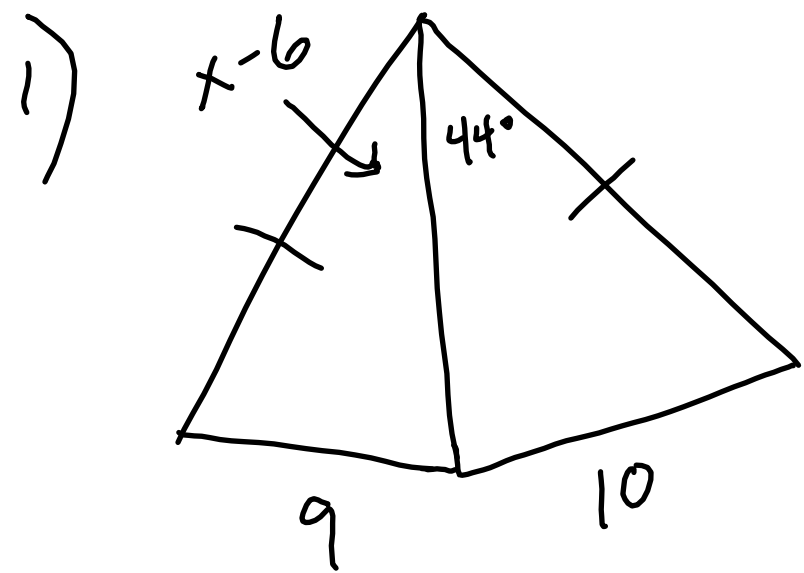
$$\underset{\text{diff}}{1} < x < \underset{\text{sum}}{11}$$

# - Two Triangles

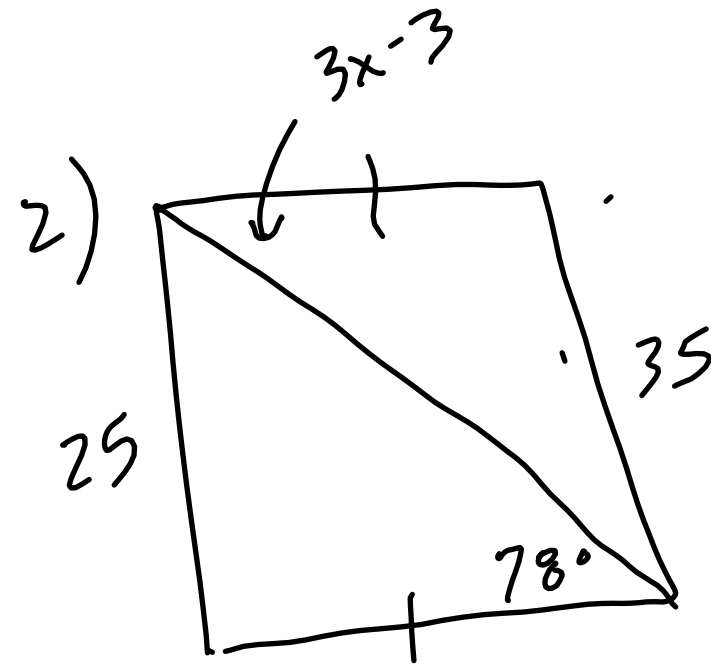
## - Hinge Theorem & Converse

↳ If 2 triangles have 2 congruent sides, the larger included angle will be opposite the larger side & vice versa

EX → Find range of values for each variable



$$\begin{array}{r} x-6 < 44 \\ +6 \quad +6 \\ \hline x < 50 \end{array}$$



$$\begin{array}{r} 3x-3 > 78 \\ +3 \quad +3 \\ \hline 3x > 81 \\ \frac{3x}{3} > \frac{81}{3} \\ x > 27 \end{array}$$

HW: p. 329 → 10-34 even

p. 336 → 6-18 even