

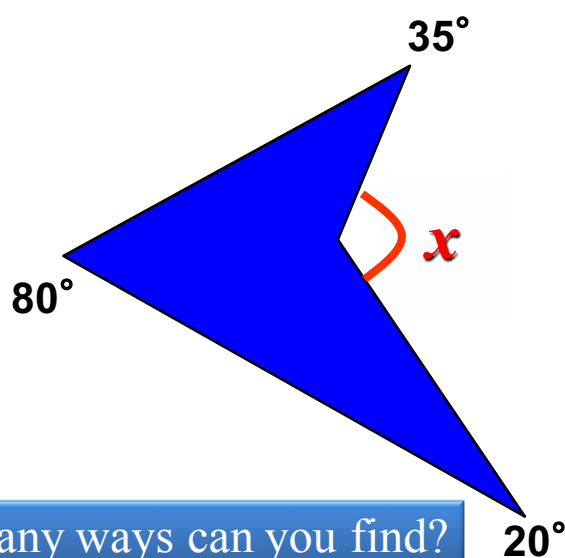
## Workshop 2

### Clarifying implicit theorems in a proof

#### Proving a Calculation of Angles

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What's the degree of  $x$  and why?



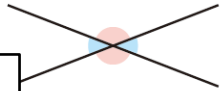
How many ways can you find?

**List of Theorems**

**Properties of vertical angles**

**I** Vertical angles are equal.

**II** Straight angle is  $180^\circ$



**Properties of parallel lines** Which theorem did you use?

When a line intersects two other lines, it is true that

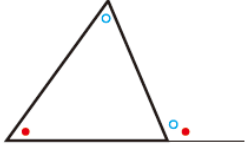
**III** Corresponding angles are equal if the two lines are parallel

**IV** Alternate interior angles are equal if the two lines are parallel

**Properties of interior and exterior angles of triangles**

**V** The sum of the three interior angles of a triangle is  $180^\circ$ .

**VI** The measure of an exterior angle of a triangle is equal to the sum of the two non-adjacent interior angles.

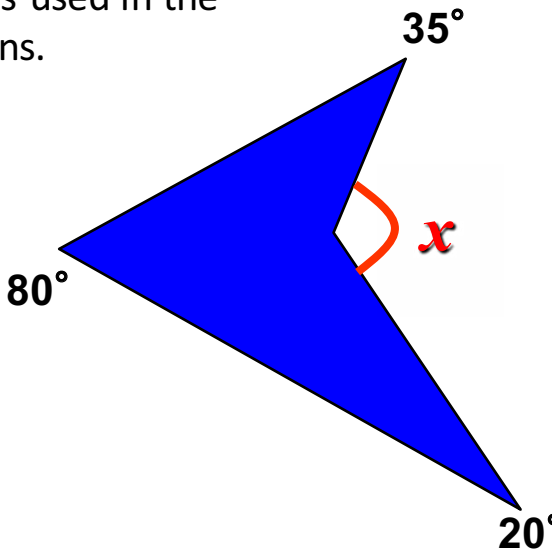


Okamoto etc. (2012). "Gateway to the future math2", Keirinkan: Osaka.

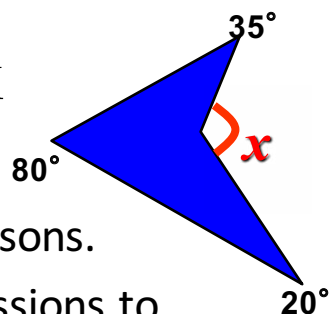
**Let's practice! Proving  $\Leftarrow$  Calculating**

Clarify the theorems used in the following expressions.

Expression 1:  
 $180 - (80 + 20) = 80$   
 $180 - 80 = 100$   
 $180 - (100 + 35) = 45$   
 $180 - 45 = 135$

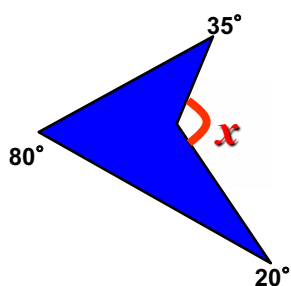


## Pair Work



- Make a group with two persons.
- You show ONLY your expressions to Partner.
- Partner finds implicit theorems in your expressions.
  - You might need the ones out of the list.
- Let's discuss the difference between your and partner's ideas.

What's the degree of  $x$  and why?



Expressions	Theorems used in the expressions

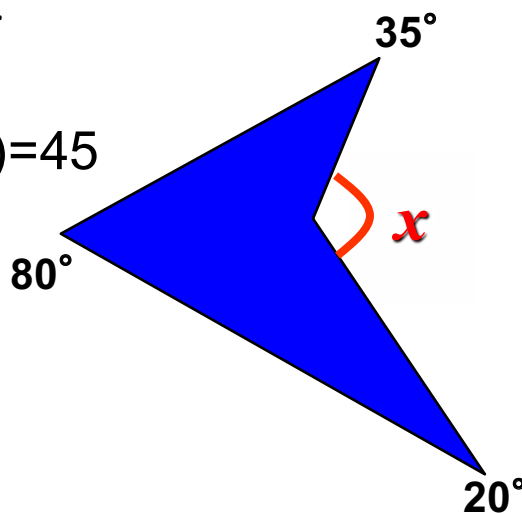
## Let's practice! Proving $\neq$ Calculating

Clarify the theorems used in the following expressions.

Expression 2:

$$180 - (80 + 20 + 35) = 45$$

$$180 - 45 = 135$$



## Let's practice! Proving $>$ Calculating

Clarify the theorems used in the following expressions.

Expression 3:

$$80 + 20 + 35 = 135$$

