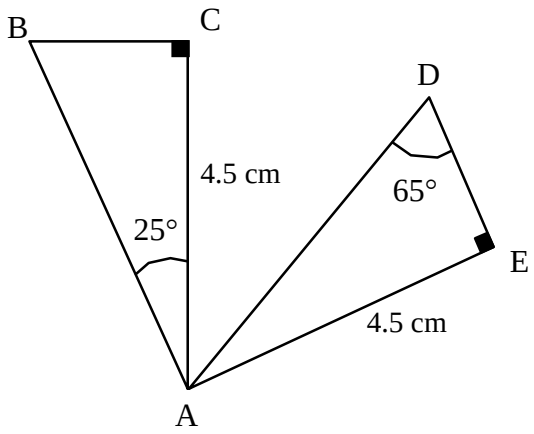
Math 4SN: Isometric Triangles and Angles: More Practice… Name: _____

1

The figure below shows triangle ABC and triangle ADE. The data given on the figure can be used to prove that these triangles are congruent.

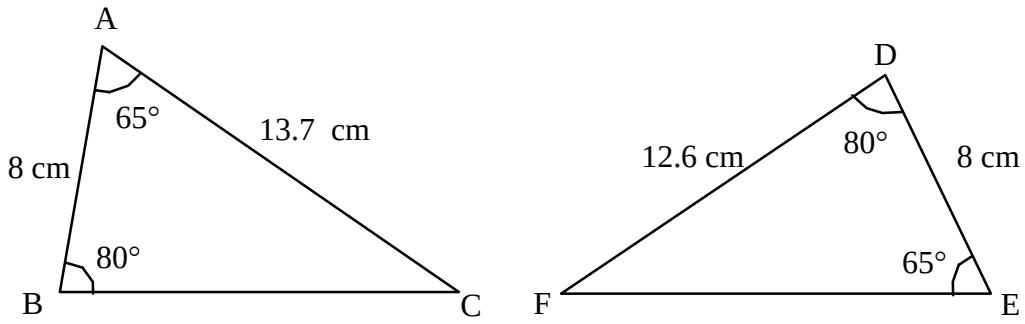


Below is the reasoning which shows that triangle ABC is congruent to triangle ADE.

	STATEMENT	JUSTIFICATION
1.	m ∠C = m ∠E = 90° m $\overline{AC}$ = m $\overline{AE}$ = 4.5 cm m ∠BAC = 25° m ∠ADE = 65°	1. _____
2.	m ∠DAE = 25°	2. _____
3.	m ∠BAC = m ∠DAE	3. _____
4.	ΔABC ≅ ΔADE	4. _____

Fill in the justifications for each statement.

2 Given triangles ABC and DEF.

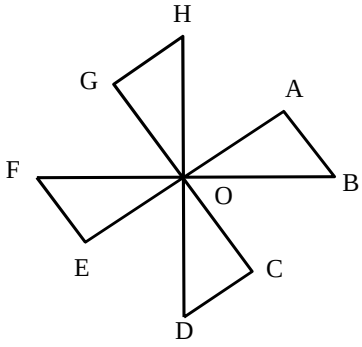


What reason can be used to explain why triangles ABC and DEF are congruent?

3 In the figure on the right,

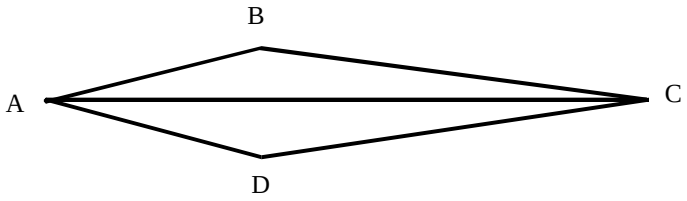
$\overline{BF} \cong \overline{DH}$
$\overline{CG} \cong \overline{AE}$
$\angle AOB \cong \angle COD$

O is the midpoint of segments BF, DH, CG and AE.



Prove that the 4 triangles are congruent?

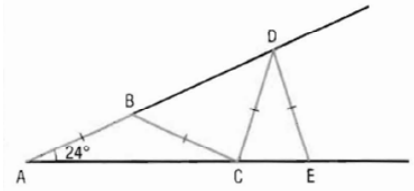
4 In the figure below, diagonal AC bisects angles A and C.



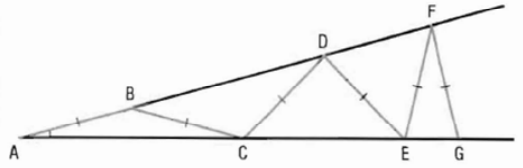
Prove that triangles ABC and ADC are isometric.

5 This will make you think…

Starting from the vertex of angle A and moving away from it, a broken line is drawn using congruent segments whose extremities touch both sides of an angle. As illustrated below, the number of triangles that can be constructed in this manner depends on the measure of angle A.



Starting from the vertex of angle A of 24°, we can construct 3 triangles.



Starting from the vertex of a smaller angle A, we can construct 5 triangles

How many triangles can be constructed, starting from the vertex, if angle A measures 4°?

6

A glimpse into your future...

CHINESE MATHEMATICS *The Nine Chapters* is a classical Chinese manuscript written about 2000 years ago. It presents solutions to over 200 problems that frequently arise in engineering, surveying, agriculture, commerce and taxation.

Here is an adaptation of one of these problems:

九章算術

A fortress, with a square base of unknown dimensions, has a door in the middle of each side. Each door is precisely oriented towards one of the four cardinal points. If you exit the fortress by the door on the North side and walk 20 paces in a straight line, you come to a tree. If you exit by the door on the South side and walk south 14 paces and then West 1775 paces, the tree comes into sight. What are the dimensions of the fortress?

Door to the Chang family fortress in China's Shan Province.

a) What are the dimensions of the base of the fortress? Explain your reasoning.

b) Imagine that upon arriving at the place from which the tree can first be seen, you walk directly towards it. What distance must you travel before the South wall of the fortress disappears from your field of vision? Justify your answer.