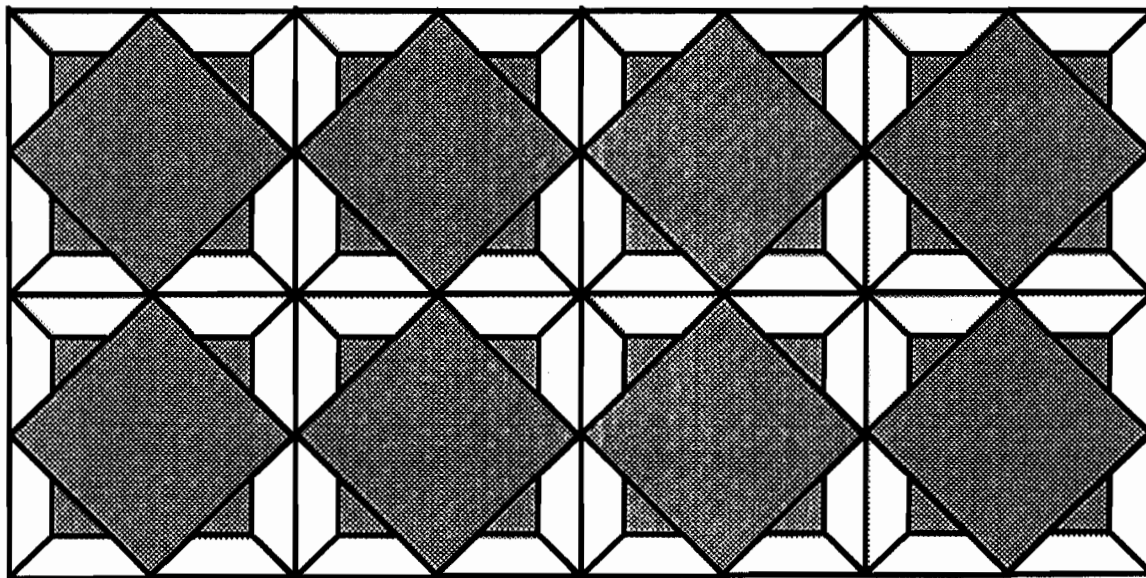
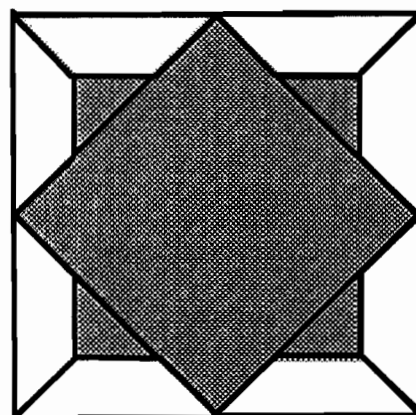


The diagram shows a floor pattern.



In the floor pattern, the shaded part is made by overlapping two equal squares.



The shaded shape can also be seen as a set of eight equal kites.

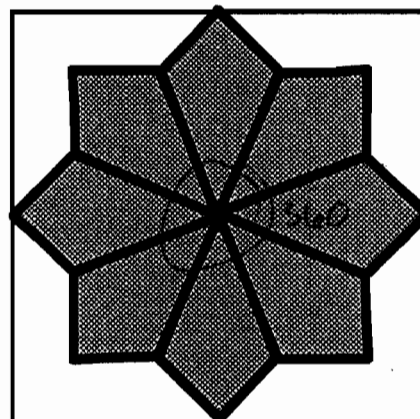
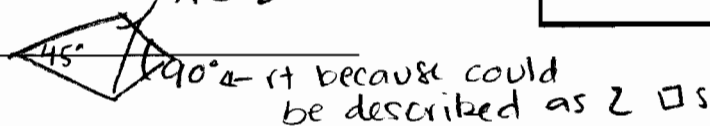
1. Find the measures of all four angles of the kites.

Explain how you obtained your answers.

$$\begin{array}{r} 45 \\ 8 \overline{) 360} \\ \underline{72} \\ 360 \\ \underline{360} \\ 0 \end{array} \quad 360 - 135 = 225^\circ$$

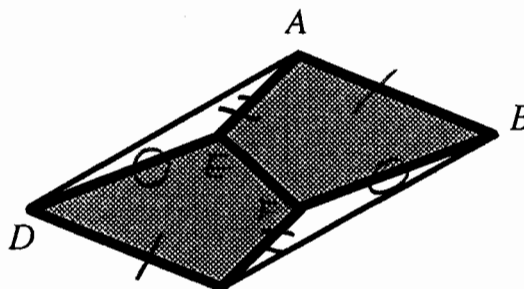
$$\begin{array}{r} 112 \frac{1}{2} \\ 2 \overline{) 225} \\ \underline{22} \\ 5 \\ \underline{4} \\ 1 \end{array}$$

These 2 are  $\cong$  because it's a kite



2. Two of the kites can fit together to make a hexagon.

Prove that the quadrilateral ABCD is a parallelogram.



$$1. \overline{AB} \cong \overline{DC}, \overline{AE} \cong \overline{CF}, \overline{DE} \cong \overline{BF}$$

$$2. \angle AED \cong \angle BFC$$

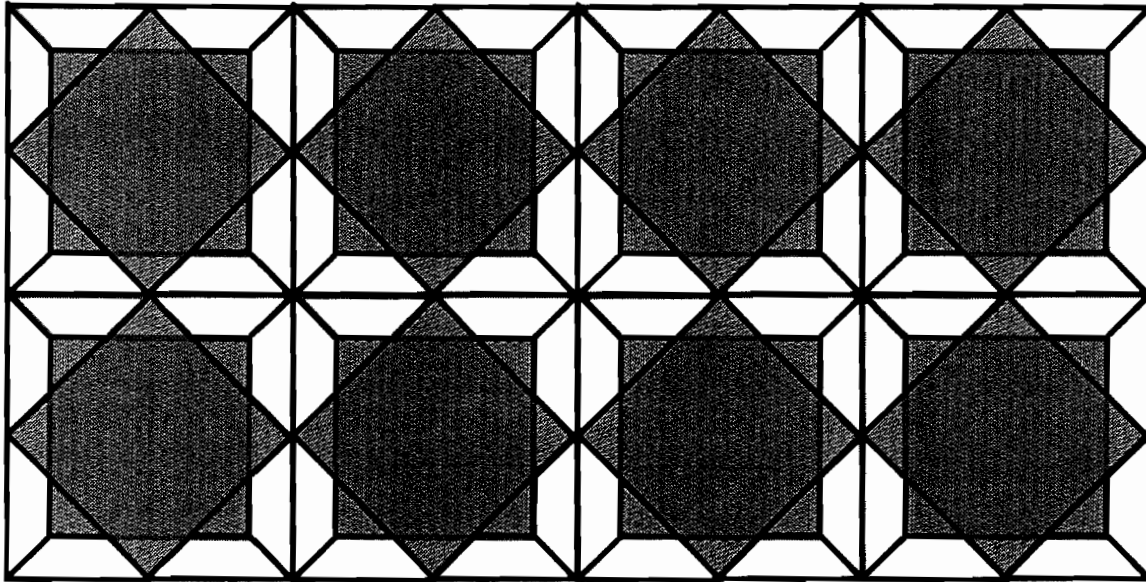
$$3. \triangle AED \cong \triangle CFB$$

$$4. \overline{AD} \cong \overline{BC}$$

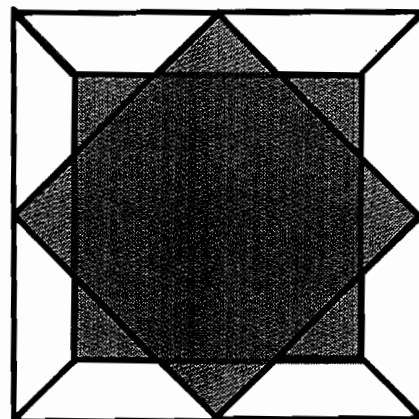
$$5. ABCD \text{ is a } \square$$

1. kites are  $\cong$ , therefore corr. sides are  $\cong$
2.  $\angle A = 360^\circ$ ,  $A \cong C$ , so left over  $\angle$ s are  $\cong$
3. 2 sides + an  $\angle$  are  $\cong$
4. CPCTC
5. two pairs of opp sides are  $\cong$

The diagram shows a floor pattern.



In the floor pattern, the shaded part is made by overlapping two equal squares.



The shaded shape can also be seen as a set of eight equal kites.

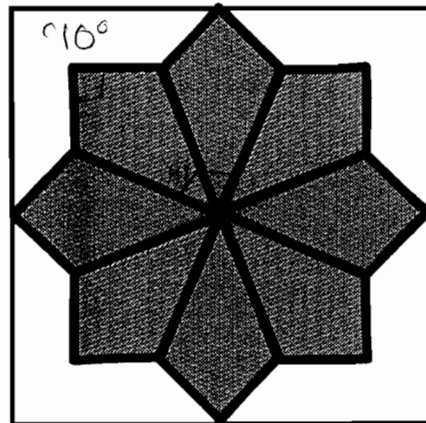
1. Find the measures of all four angles of the kites.

Explain how you obtained your answers.

1st  $\angle$  is  $90^\circ$

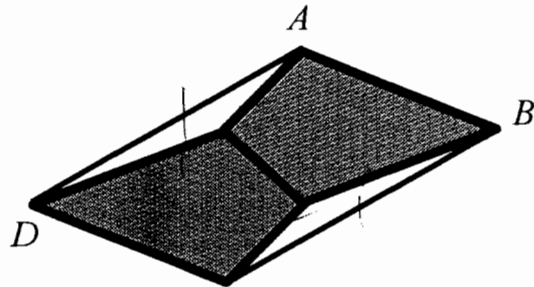
2nd  $\angle = 45^\circ$

3rd & 4th  $\angle$ 's are  $112.5^\circ$



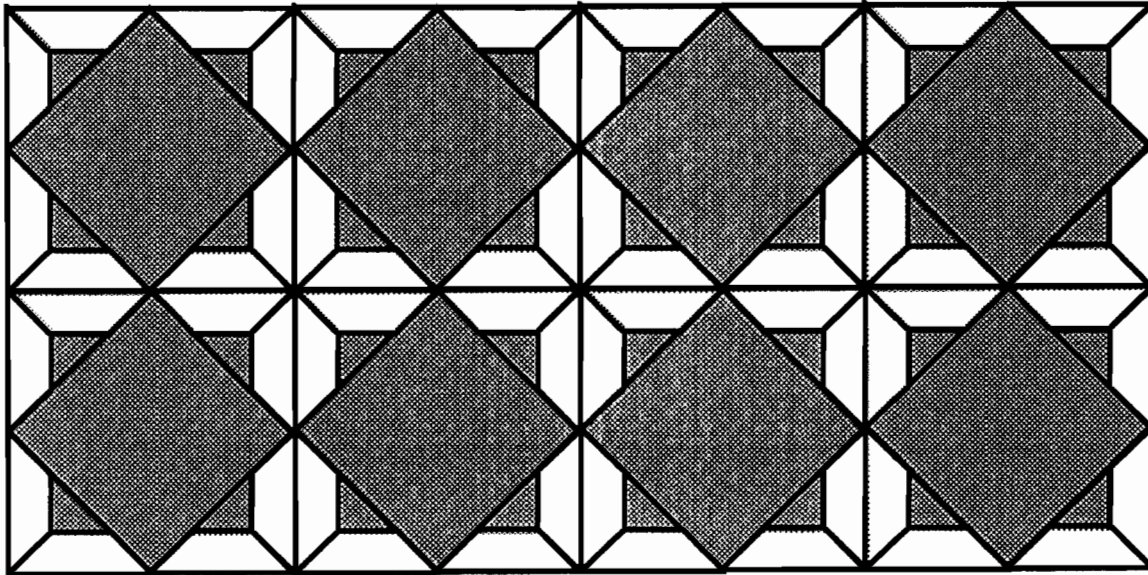
2. Two of the kites can fit together to make a hexagon.

Prove that the quadrilateral ABCD is a parallelogram.

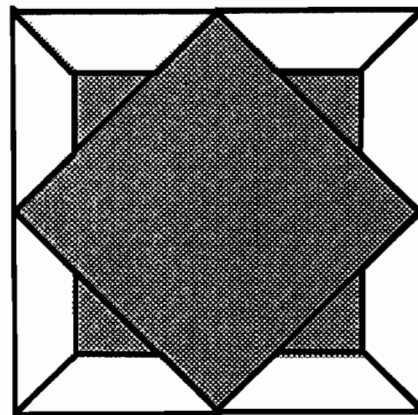


The two unshaded kite things are congruent because of SAS,  $\angle$  D + the unshaded angle is congruent to the other angle (B) and for same is true for  $A = C$ , so opposite  $\angle$ 's congruent, it must be a parallelogram

The diagram shows a floor pattern.



In the floor pattern, the shaded part is made by overlapping two equal squares.

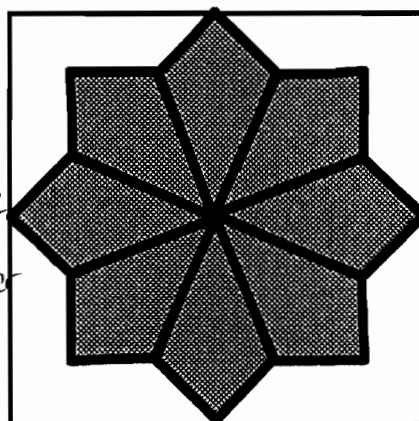


The shaded shape can also be seen as a set of eight equal kites.

1. Find the measures of all four angles of the kites.

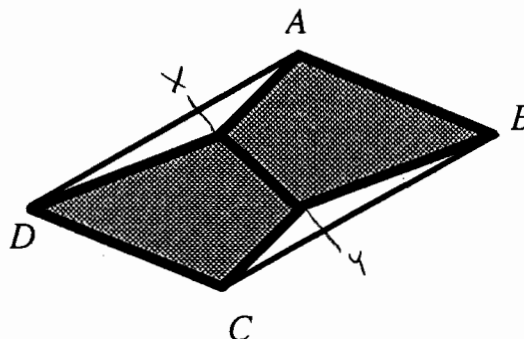
Explain how you obtained your answers.

The inner most angle is  $45^\circ$  because they form a  $360^\circ$  with eight angles. The outer angle is  $90^\circ$  because properties of a square, the other two angles are a half of  $360 - 135 = 225$   
 $225 / 2 = 112.5$  because they are equal by properties of a kite.



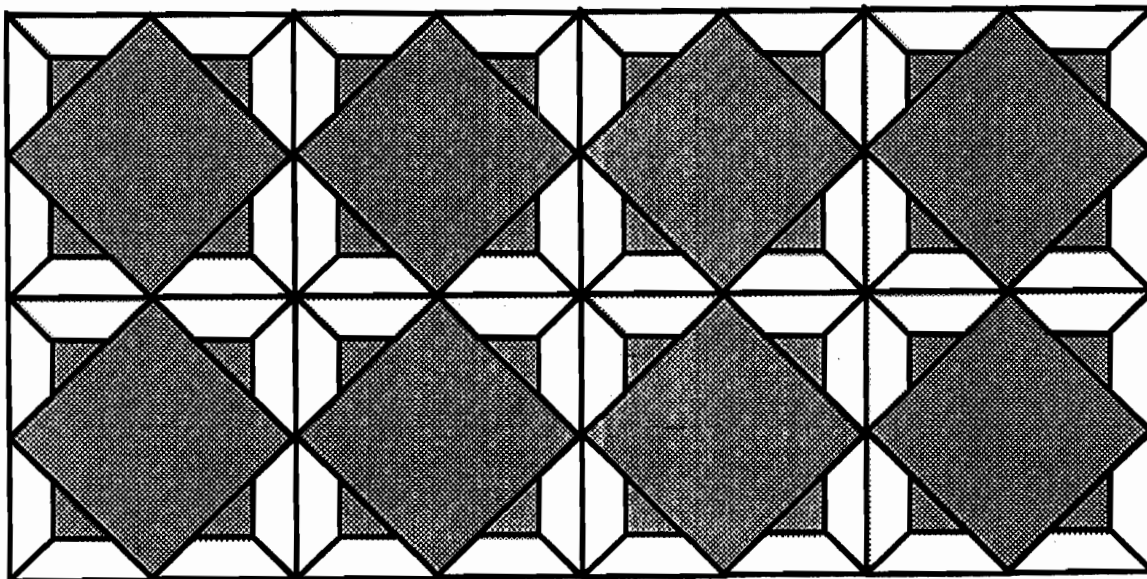
2. Two of the kites can fit together to make a hexagon.

Prove that the quadrilateral ABCD is a parallelogram.

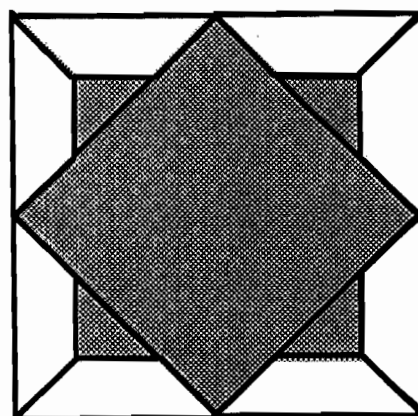


$\overline{DC} \cong \overline{AB}$  because the kites are equal by CPCTC. I drew points X & Y. As proved by the previous problem  $m\angle AXY = 90^\circ$  and  $m\angle DXY = 112.5^\circ$  so  $m\angle AXD$  must be  $360 - 112.5 - 90 = 157.5$ .  $\triangle AXD$  is isos. because  $\overline{AX} \cong \overline{XD}$  by CPCTC. So,  $\angle XAD \cong \angle ADX$  and they both are equal since they both equal  $112.5^\circ$ .  $\angle ADC$  and  $\angle BAD$  are supp so  $\overline{AB} \parallel \overline{DC}$  because  $\cong \angle$ 's int.  $\Rightarrow \parallel$  lines. Since one pair of opp. side are both  $\cong$  and  $\parallel$ , the quad. must be a parallelogram.

The diagram shows a floor pattern.



In the floor pattern, the shaded part is made by overlapping two equal squares.

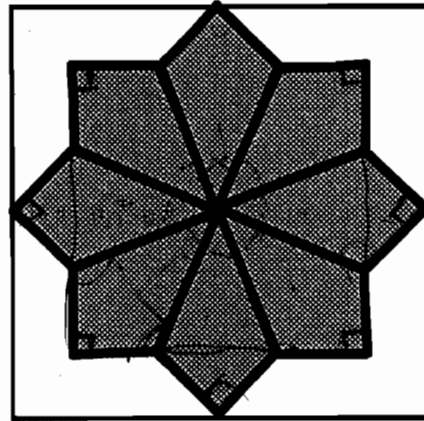


The shaded shape can also be seen as a set of eight equal kites.

1. Find the measures of all four angles of the kites.

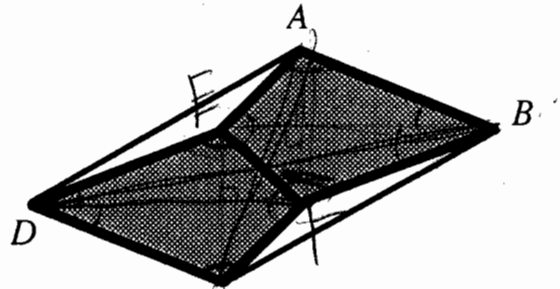
Explain how you obtained your answers.

The outer angles are all right,  $90^\circ$   
 because it is made of two squares  
 The closest to the middle  $\frac{360}{8}$   
 $= 45^\circ$  The other 2 are congruent,  
 $225/2$  or  $112.5$  each

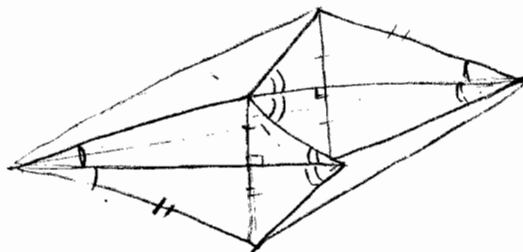


2. Two of the kites can fit together to make a hexagon.

Prove that the quadrilateral ABCD is a parallelogram.

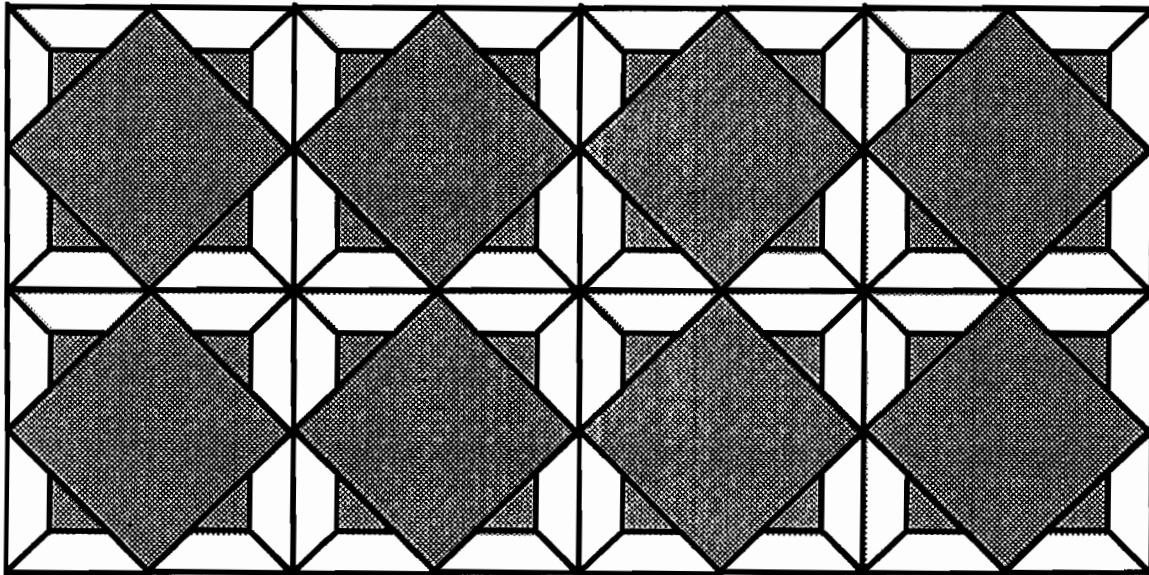


The kites are to some and equal because  $\overline{EF} \cong \overline{FC}$ ,  $\overline{EF} \cong \overline{AE}$  so  $\overline{DC} \cong \overline{AB}$   
 and  $\overline{DE} \cong \overline{EB}$ ,  $\overline{AE} \cong \overline{EC}$ .  $\angle AED$  is congruent to  $\angle BFC$  because  
 $\angle AEF \cong \angle EFC$  and  $\angle DEF \cong \angle EFB$  and they all add up  
 to  $360^\circ$ , which is proved by the Subtraction Property. Therefore  
 $\triangle AED \cong \triangle CFB$  by SAS, and  $\overline{AD} \cong \overline{BC}$  by CPCTC.  
 If a quadrilateral has two pairs of opposite sides  
 congruent, it is a parallelogram.

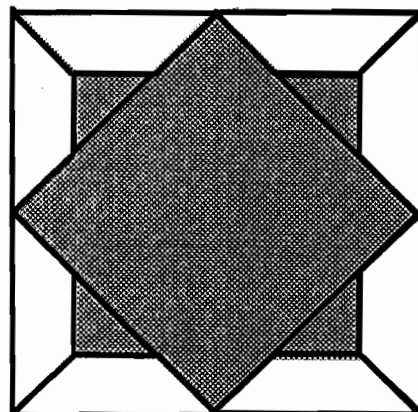




The diagram shows a floor pattern.



In the floor pattern, the shaded part is made by overlapping two equal squares.



The shaded shape can also be seen as a set of eight equal kites.

1. Find the measures of all four angles of the kites.

Explain how you obtained your answers.

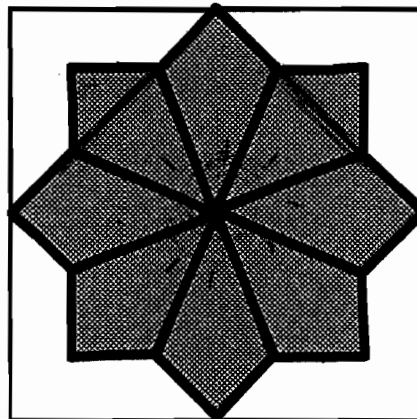
$$\frac{360}{8} = 45 - \text{Inner Angle}$$

$$\frac{180 - 45}{2} = 67.5 - \text{part of the 2 side } \Delta\text{'s}$$

90 - outer angle (corner of a square)

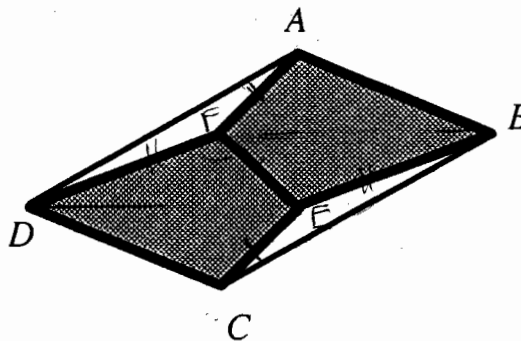
$$\frac{180 - 90}{2} = 45 - 2^{\text{nd}} \text{ part of side } \Delta\text{'s}$$

$$45 + 67.5 = 112.5 - \text{side } \Delta\text{'s}$$



2. Two of the kites can fit together to make a hexagon.

Prove that the quadrilateral ABCD is a parallelogram.



$\overline{AF} \cong \overline{EC}$   
 $\overline{DF} \cong \overline{EB}$   
 $\overline{DC} = \overline{AB}$  according to congruent corresponding parts.

Angle  $\angle AFD \cong \angle CEB$  because  $\angle AFE \cong \angle FEC$  and  $\angle DFE \cong \angle FEB$ .

Therefore,  $\triangle AFD \cong \triangle CEB$  Through  $\overline{CA} = \overline{TC}$ ,  $\overline{AD} \cong \overline{CB}$ . Therefore,

ABCD is a parallelogram ~~is~~