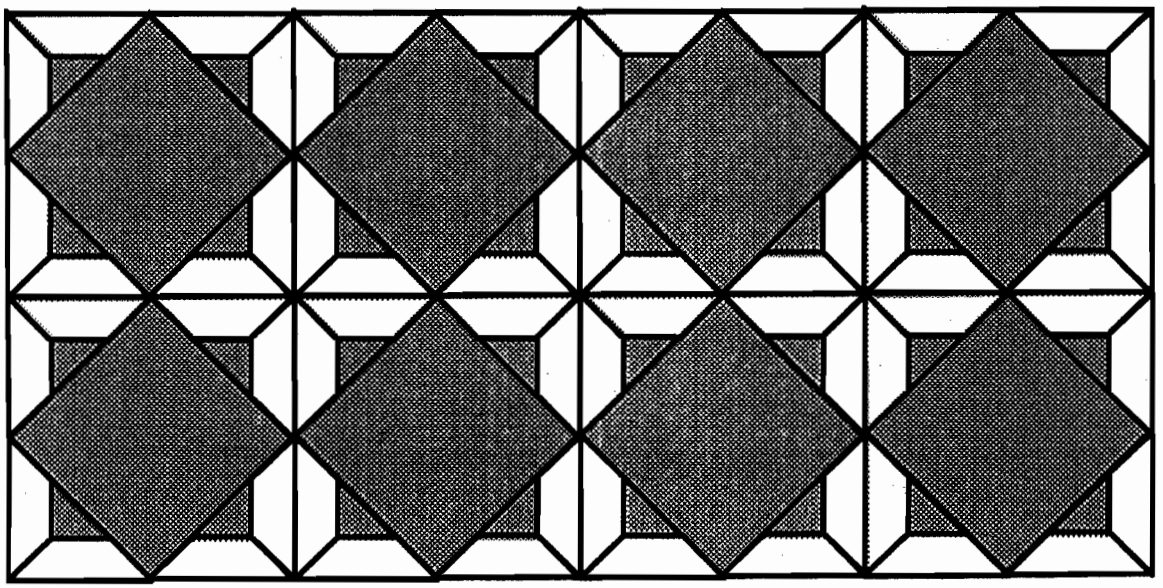
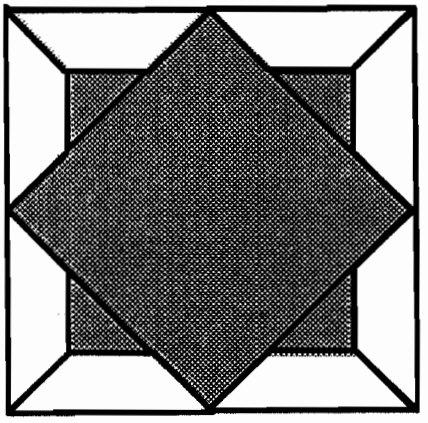
Floor Pattern

T1

The diagram shows a floor pattern.



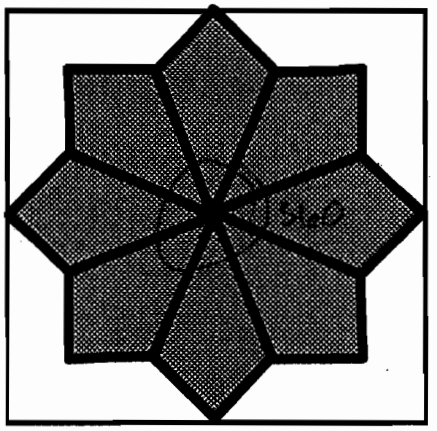
In the floor pattern, the shaded part is made by overlapping two equal squares.



T1

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.

45
8|360 ✓ 360 - 135 = 225° ✓
-40

112 1/2
2|225
02
05
4
1

these 2 are ≅ because it's a kite

112 1/2° ✓

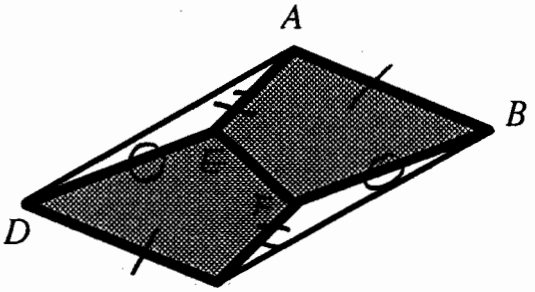
45° 90° ∠ rt because could be described as 2 □s ✓

4

2

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

Prove that the quadrilateral ABCD is a parallelogram.



1

1 $\overline{AB} \cong \overline{DC}$, $\overline{AE} \cong \overline{CF}$, $\overline{DE} \cong \overline{BF}$ ✓	1 kites are ≅, therefore corr. sides are ≅
2 $\angle AED \cong \angle BFC$ ✓	2 ∠ sum = 360°, ∠ ≅ ∠, so left over ∠s are ≅
3 $\triangle AED \cong \triangle CFB$ ✓	3 2 sides + an ∠ are ≅
4 $\overline{AD} \cong \overline{BC}$ ✓	4. CPCTC
5 ABCD's a □ ✓	5. two pairs of opp sides are ≅

3

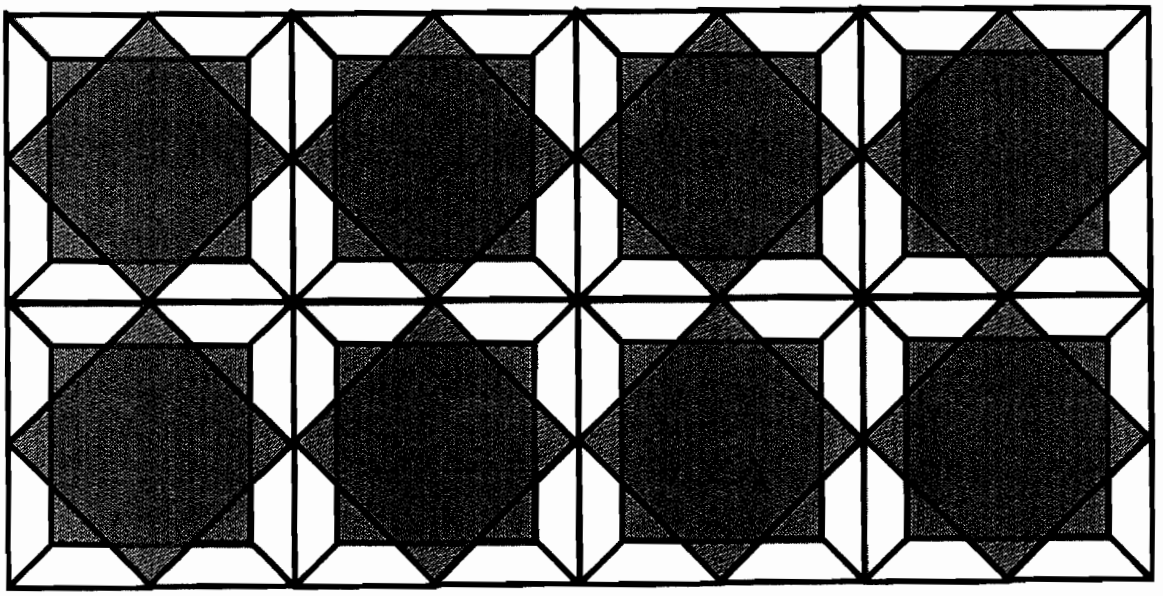
CCR 5

10

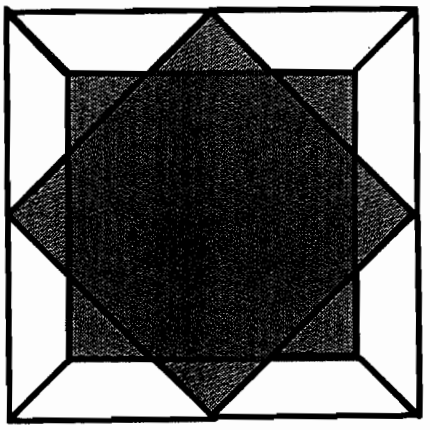
Floor Pattern

T2

The diagram shows a floor pattern.

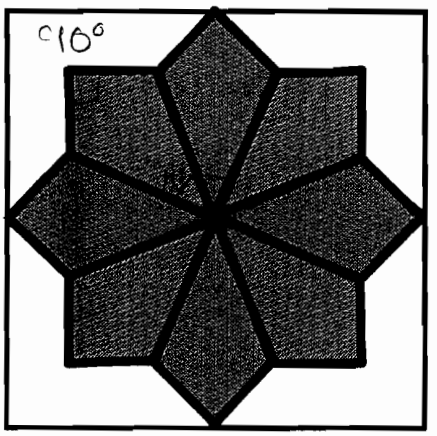


In the floor pattern, the shaded part is made by overlapping two equal squares.



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.



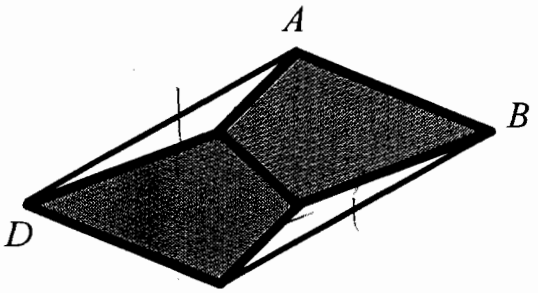
Explain how you obtained your answers.

1st ∠ is 90° ✓
2nd ∠ = 45° ✓
3rd & 4th ∠'s are 112.5° ✓ ✓

1 1 1 1 1 0 0

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

Prove that the quadrilateral ABCD is a parallelogram.



1

The two unshaded outer things are Congruent because of SAS, ∠ Angle D ← the unshaded area is Congruent to the other Angle (B) and the same is true for A = C, So if opposite ∠'s Congruent, it must be a parrellelogram

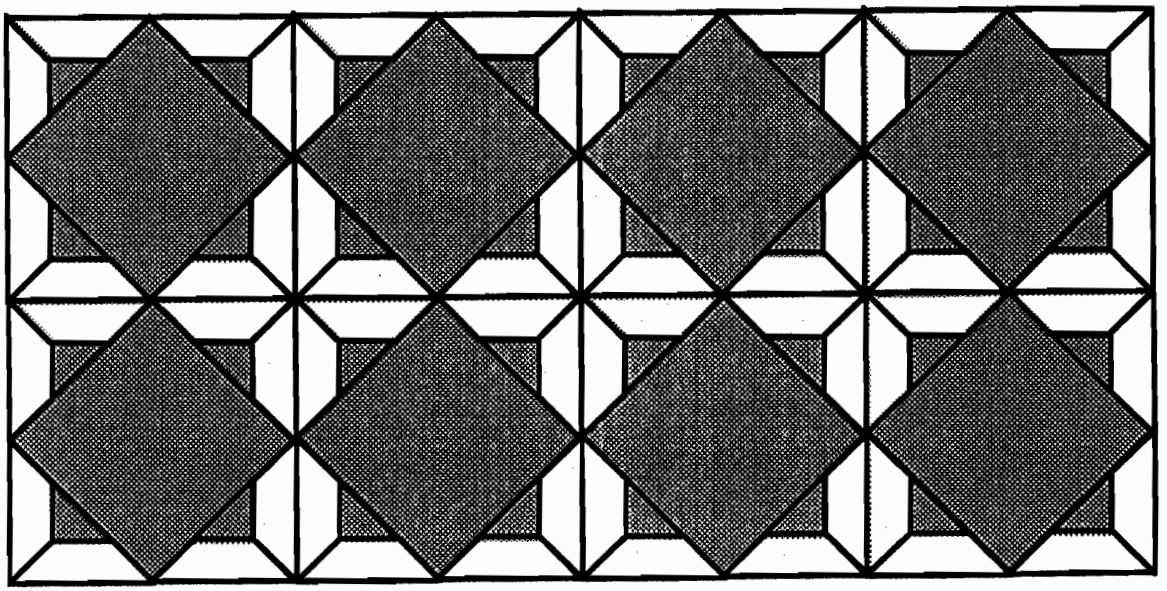
3

 (8)

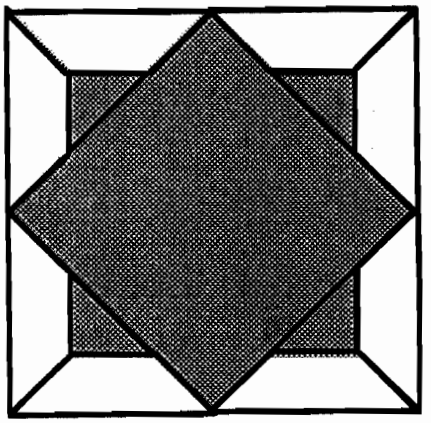
Floor Pattern

T3

The diagram shows a floor pattern.



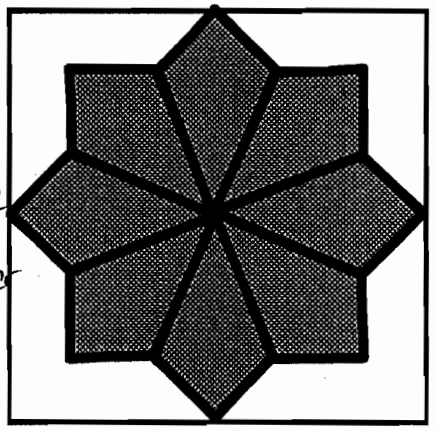
In the floor pattern, the shaded part is made by overlapping two equal squares.



T3

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.

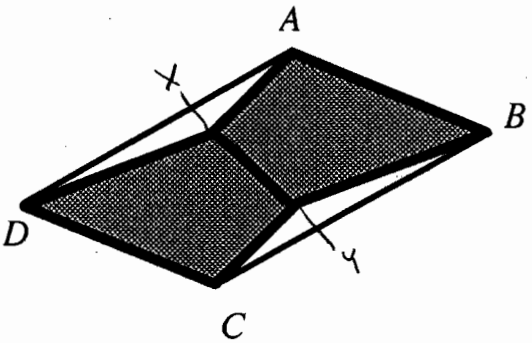
The inner most angle is 45° because they form a 360° ✓ with the eight angles. The outer angle is 90° because properties of ✓ a square, the other two angles are a half of 360-135=225 225/2 = 112.5 because they are equal by properties of a kite. ✓

4

2

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

Prove that the quadrilateral ABCD is a parallelogram.



1

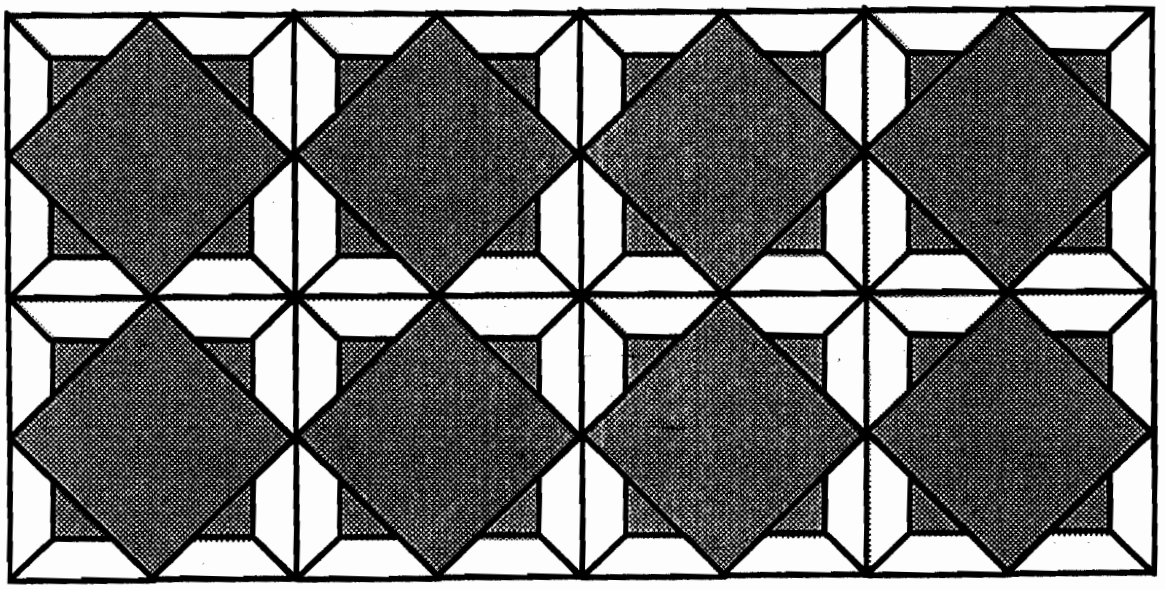
$\overline{DC} \cong \overline{AB}$ ✓ because the kites are equal by CPCTC. I drew points X & Y. As proved by the previous problem $m\angle AXY = 90°$ and $m\angle DXY = 112.5°$ so $m\angle AXD$ must be 360-112.5-90= 57.5. $\triangle AXD$ is isos. because $\overline{AX} \cong \overline{XD}$ by CPCTC. So, $\angle XAD \cong \angle ADX$ and they both are equal since they both equal 112.5°. $\angle ADC$ 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 ✓

3

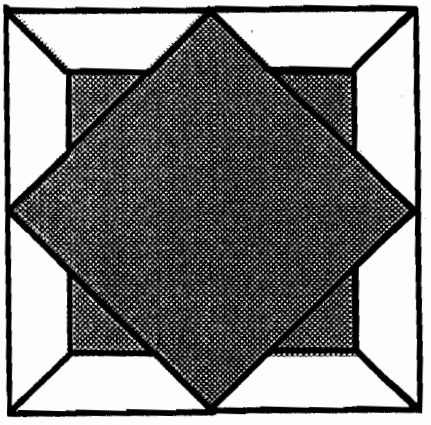
Floor Pattern

T4

The diagram shows a floor pattern.



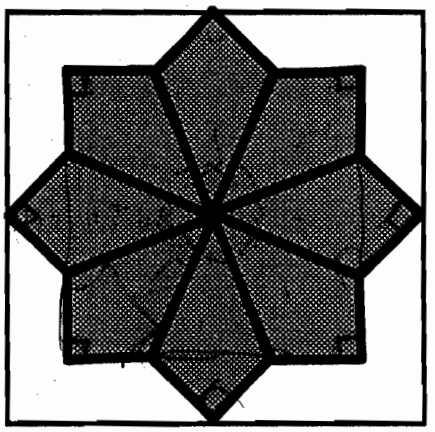
In the floor pattern, the shaded part is made by overlapping two equal squares.



T4

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

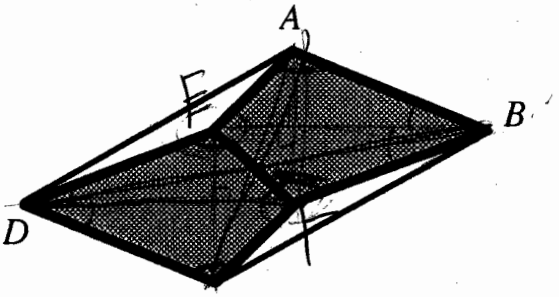
1. Find the measures of all four angles of the kites.



Explain how you obtained your answers.

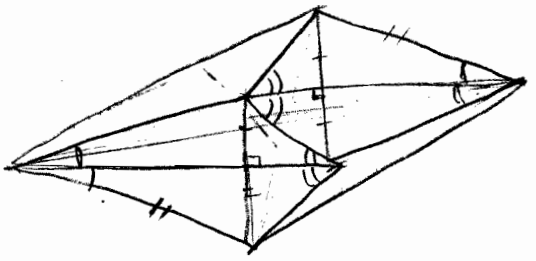
The outer angles are all right, 90° ✓ because it is made of two squares. The closest to the middle 360/8 ✓ = 45° The other 2 are congruent, ✓ 225/2 or 112.5 each. 4 2

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



Prove that the quadrilateral ABCD is a parallelogram.

The kites are the same and equal because $\overline{EF} \cong \overline{FC}$, $\overline{EF} \cong \overline{AE}$ ✓ so $\overline{DC} \cong \overline{AB}$ and $\overline{DF} \cong \overline{FB}$, $\overline{AE} \cong \overline{FC}$ ✓ $\angle AED$ is congruent to $\angle BFC$ because $\angle AEF \cong \angle EFC$ and $\angle DEF \cong \angle EFB$ and they all add up to 360°, 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. ✓ 1 3

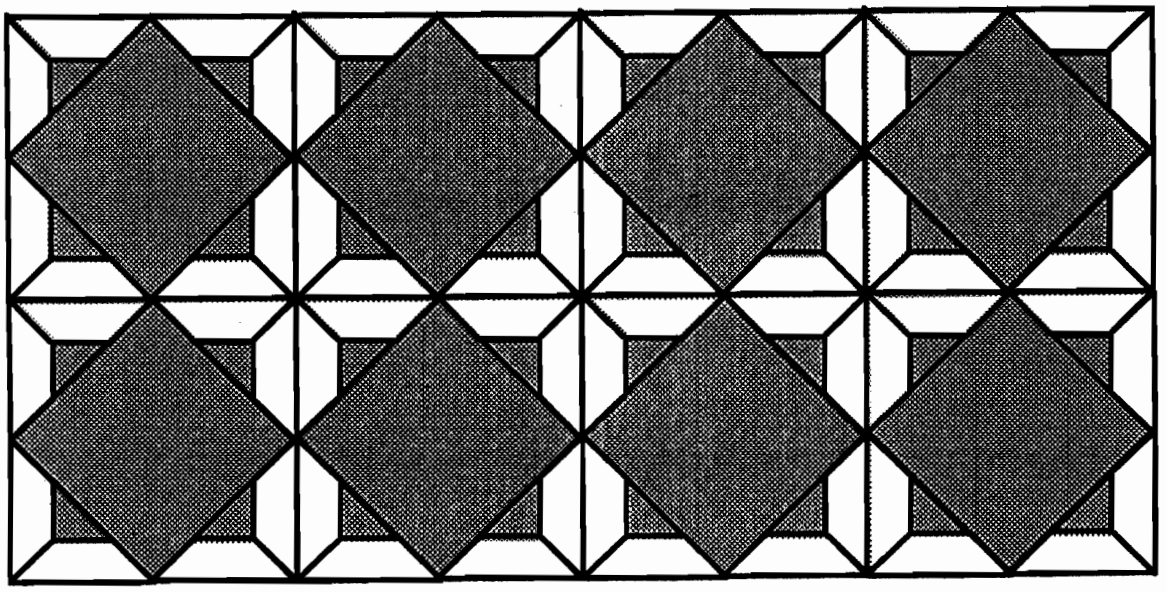


10

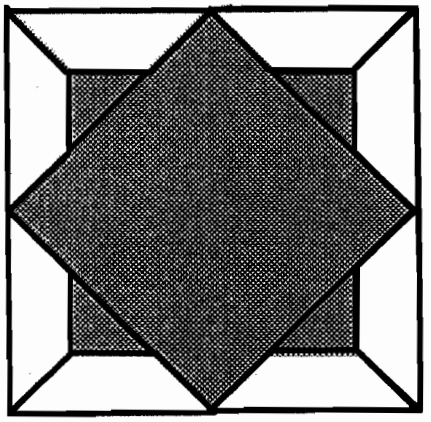
Floor Pattern

T5

The diagram shows a floor pattern.



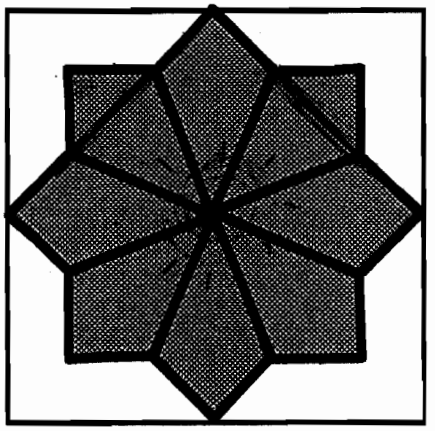
In the floor pattern, the shaded part is made by overlapping two equal squares.



T5

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.



4

Explain how you obtained your answers.

$\frac{360}{8}$ = 45 – Inner Angle ✓

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

90 – outer angle (corner of a square) ✓

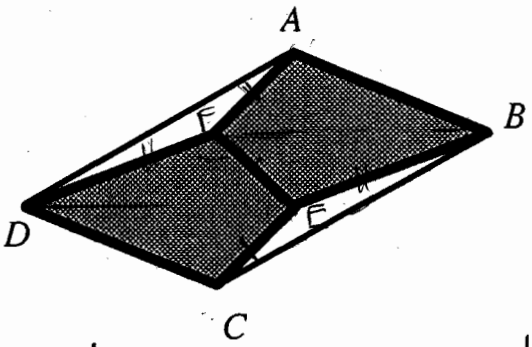
$\frac{180-90}{2}$ = 45 – 2nd part of side ∠'s

45 + 67.5 = 112.5 – side ∠'s ✓

2

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 ∠AFD ≅ ∠CEB because ∠AFE ≅ ∠FEC and ∠DFE ≅ ∠FEB.

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

ABCD is a parallelogram ✓

1

3

CCR 5

10