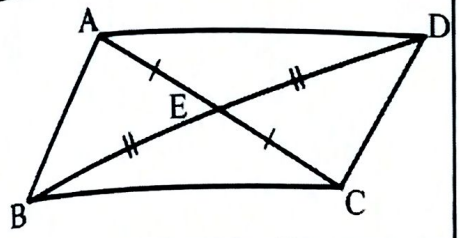
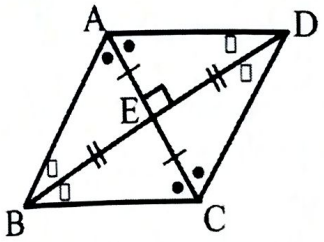
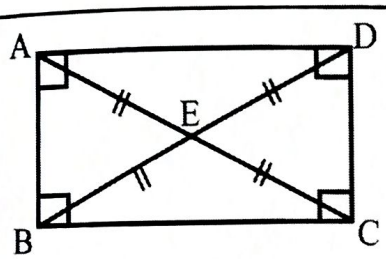
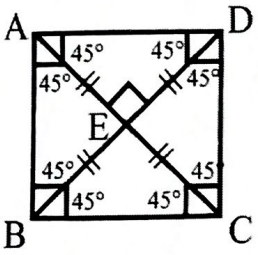
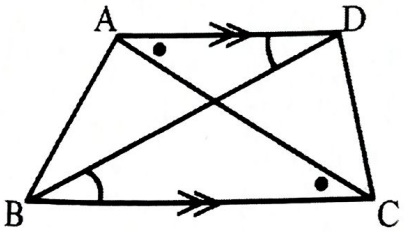
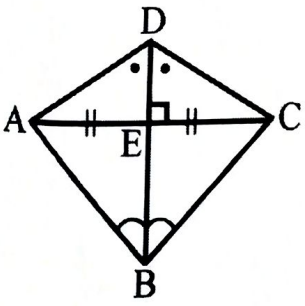
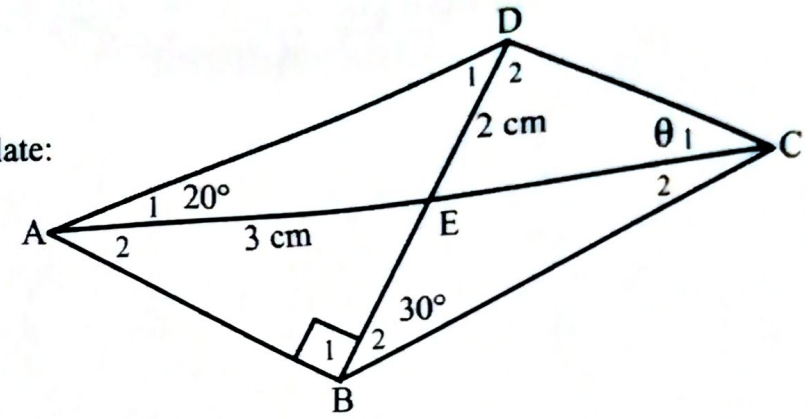
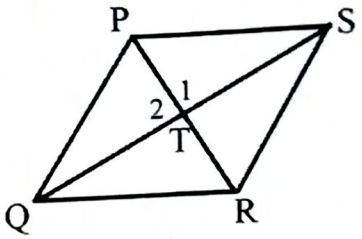
## Summary of the properties of quadrilaterals (diagonals, angles and sides)

| Quadrilateral | Diagonals | Angles | Sides |
|---|---|---|---|
|  | The diagonals of a parallelogram bisect each other. | The opposite angles of a parallelogram are equal. The interior angles add up to 360°. | The opposite sides of a parallelogram are parallel and equal. |
|  | The diagonals of a rhombus bisect each other at right angles. The diagonals bisect the vertex angles. | The opposite angles of a rhombus are equal. The interior angles add up to 360°. | The opposite sides of a rhombus are parallel and all sides are equal. |
|  | The diagonals of a rectangle bisect each other and are equal in length. | The interior angles of a rectangle are equal to 90°. The interior angles add up to 360°. | The opposite sides of a rectangle are parallel and equal. |
|  | The diagonals of a square bisect each other at right angles and are equal in length. The diagonals bisect the vertex angles. | The interior angles of a square are equal to 90°. The interior angles add up to 360°. | The opposite sides of a square are parallel and all sides are equal. |
|  | The diagonals of a trapezium intersect but don't bisect each other. They lie between parallel lines and therefore the alternate angles are equal. | The interior angles add up to 360°. | One pair of opposite sides are parallel. |
|  | The diagonals are perpendicular and one diagonal bisects the other. One of the diagonals bisects the vertex angles. | One pair of opposite angles are equal. The interior angles add up to 360°. | Two pairs of adjacent sides are equal. |

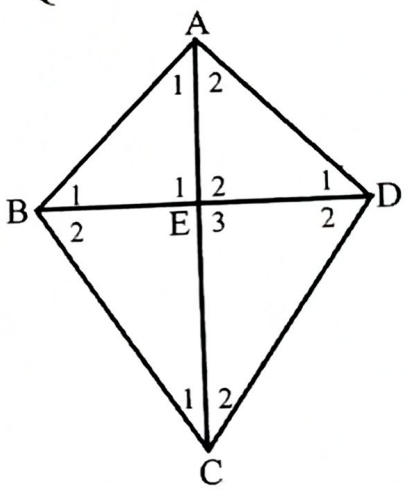
(c) ABCD is a parallelogram.
$\hat{A}_1 = 20°$, $\hat{B}_1 = 90°$, $\hat{B}_2 = 30°$,
DE = 2 cm and AE = 3 cm. Calculate:
(1) the length of AC and BD
(2) the size of θ



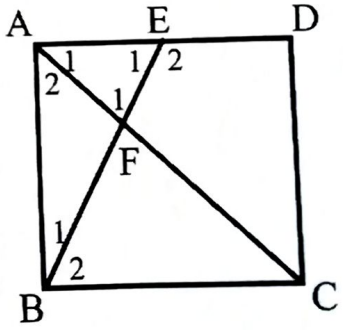

(d) In rhombus PQRS, PQ = 26 cm and QS = 48 cm.
Calculate the length of PR.




(e) ABCD is a kite. The diagonals intersect at E. BD = 30 cm, AD = 17 cm and DC = 25 cm. Determine:
(1) AE
(2) AC
(3) $\hat{B}_1$ if $\hat{A}_1 = 20°$




(f) ABCD is a square. $A\hat{E}B = 54°$.
Calculate $\hat{F}_1$.




(g) ABCD is a rectangle and DECF is a rhombus. $D\hat{E}C = 60°$
(1) Calculate the size of:
$\hat{E}_1, \hat{F}_1, \hat{B}_2$ and $\hat{B}_1$
(2) Calculate the length of AC if EC = 4 cm