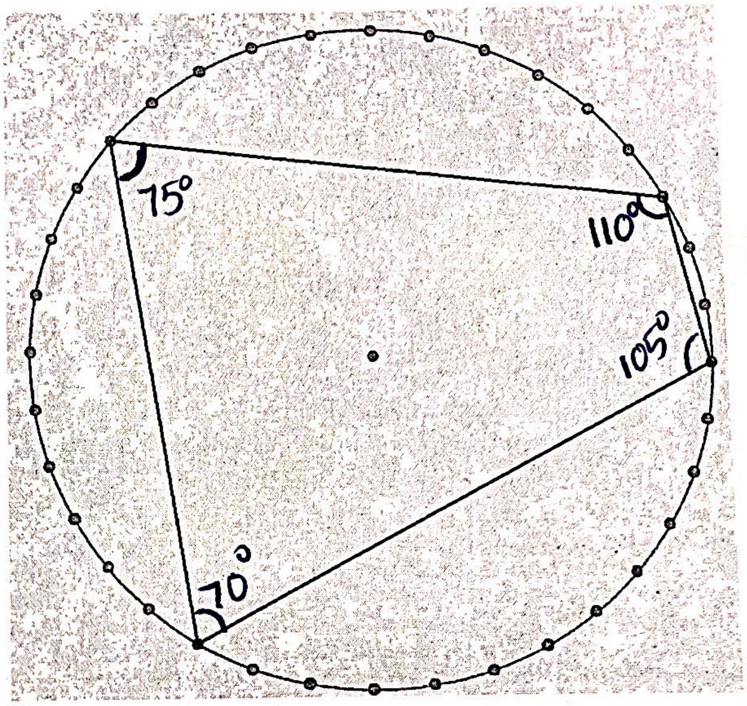
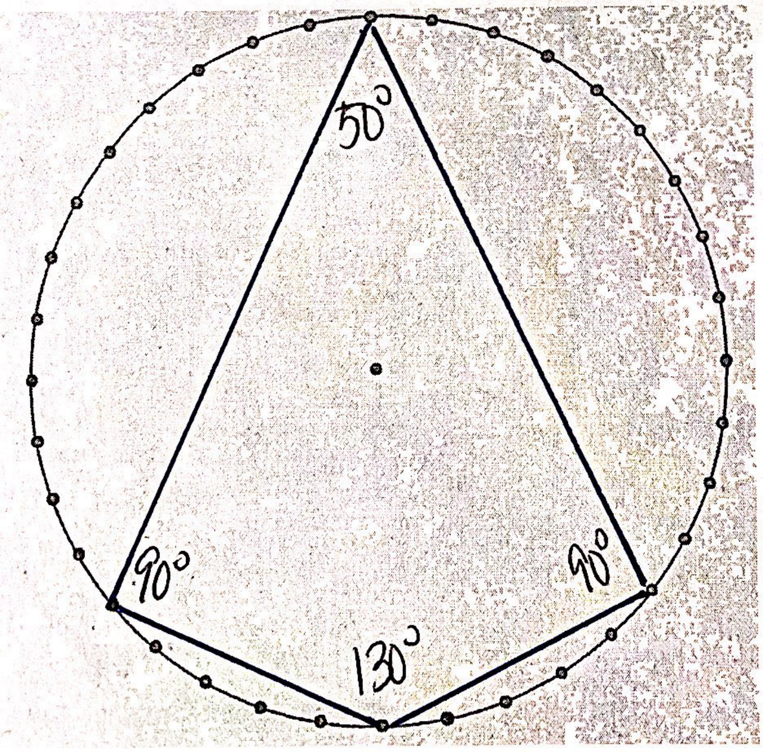
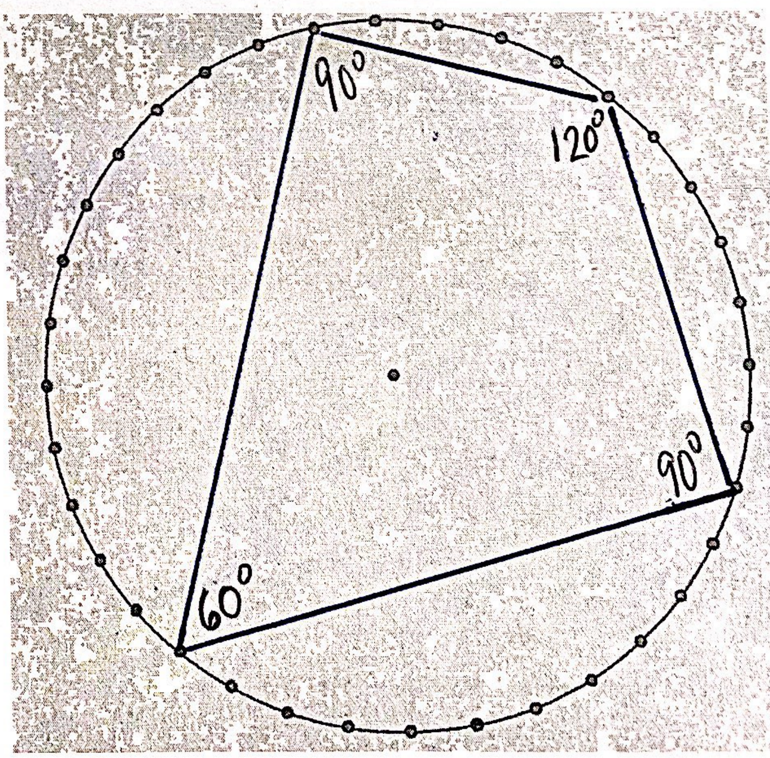
Inscribed Quadrilateral

If a quadrilateral is inscribed in a circle, the opposite angles are supplementary.







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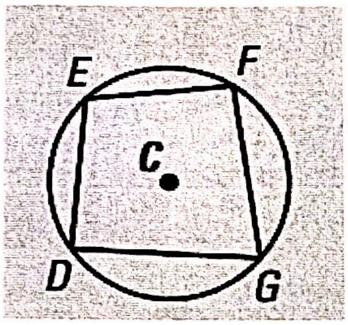
Inscribed Quadrilaterals

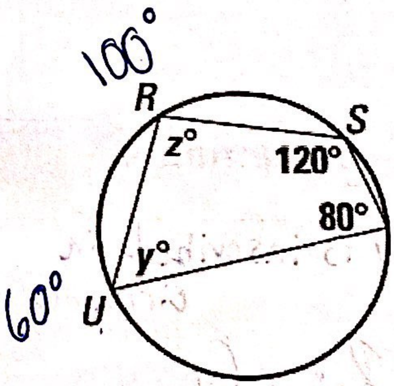
Theorem: “If a quadrilateral is inscribed in a circle, then its opposite angles are supplementary.”



$$\angle E + \angle G = 180° \quad \text{and} \quad \angle D + \angle F = 180°$$

EXAMPLE

Find the values of y and z.



Solution

Because $RSTU$ is inscribed in a circle, opposite angles must be supplementary.

$\angle S$ and $\angle U$ are opposite angles.

$$m\angle S + m\angle U = 180°$$

$$120° + y° = 180°$$

$$y = 60$$

$\angle R$ and $\angle T$ are opposite angles.

$$m\angle R + m\angle T = 180°$$

$$z° + 80° = 180°$$

$$z = 100$$

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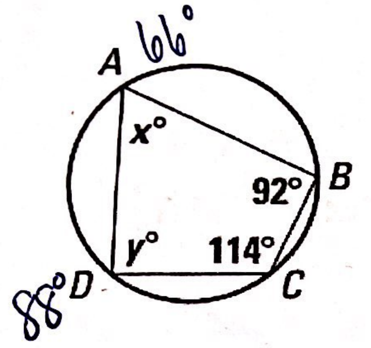
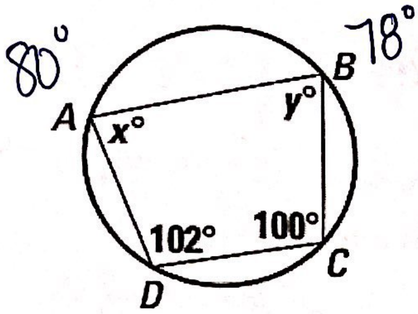
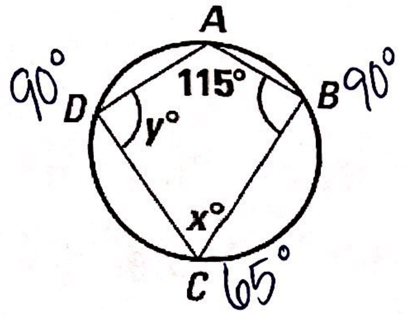
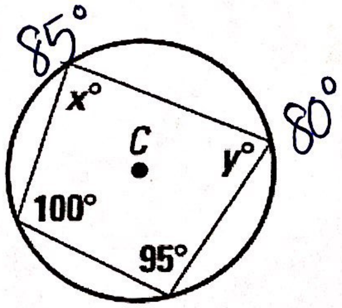
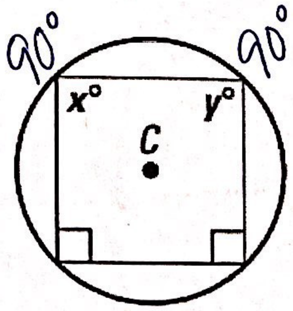
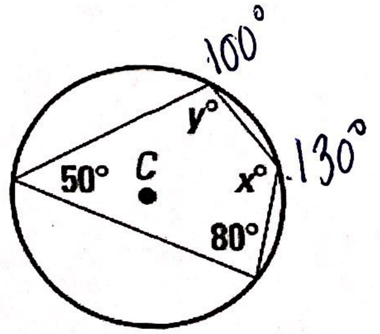








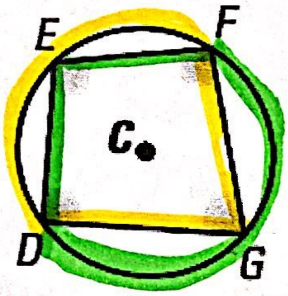




Proof: "Opposite angles of an inscribed quadrilateral are supplementary."

Given: Quadrilateral DEFG is inscribed in Circle C.

Prove: $\angle E + \angle G = 180°$



Statements	Reasons
Quad DEFG is inscribed in circle C	Given
$\overset{\frown}{DEF} = 2 \cdot \angle G$	Def of Inscribed angles
$\overset{\frown}{DGF} = 2 \cdot \angle E$	Def of Inscribed angles
$\overset{\frown}{DGF} + \overset{\frown}{DEF} = 360°$	circle = 360°
$2 \cdot \angle E + 2 \cdot \angle G = 360°$	Substitution
$\angle E + \angle G = 180°$	Divide by 2

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