

# Secants, Tangents and Angle Measures

## Recall:

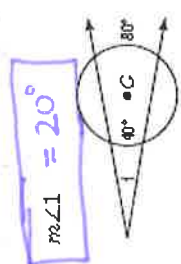
- A secant line is a line that intersects a circle in exactly two points.
- A tangent line intersects at exactly one point.
- The measures of angles formed by secants and tangents are related to arcs.

Inscribed Angles: Half of the intercepted arc measure

Interior Angles: Half the sum of the intercepted arc measures

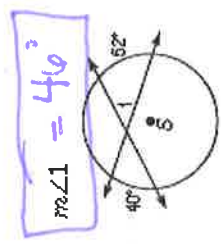
Exterior Angles: Half the difference of the intercepted arc measures

Review: Solving for interior and exterior angles



$$m\angle 1 = 20^\circ$$

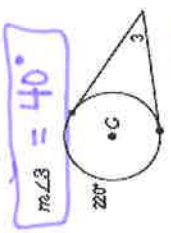
$$\frac{80 - 80}{2} = \frac{40}{2} = 20$$



$$m\angle 1 = 46^\circ$$

$$\frac{52 + 92}{2} = \frac{144}{2} = 72$$

Example: Find the missing arc or angle measure in each figure.

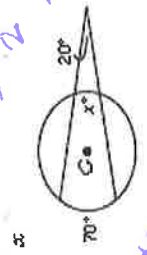


$$m\angle 3 = 40^\circ$$

$$360 - 220 = 140$$

$$\frac{220 - 140}{2} = m\angle 3$$

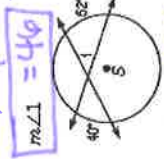
$$\frac{80}{2} = 40$$



$$\frac{70 - x}{2} = 20$$

$$70 - x = 40$$

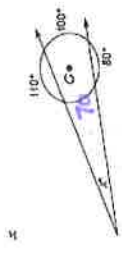
same as prev. ex.



$$m\angle 1 = 46^\circ$$

$$\frac{52 + 40}{2} = \frac{92}{2} = 46$$

Practice: Find the missing arc or angle measure in each figure.

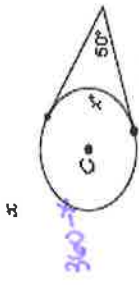


$$100 + 80 + 110 = 290$$

$$360 - 290 = 70$$

$$\frac{100 - 70}{2} = x$$

$$\frac{30}{2} = 15 = x$$



$$\frac{(360 - x) - x}{2} = 50$$

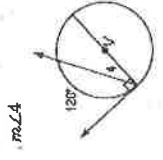
$$\frac{360 - 2x}{2} = 50$$

$$360 - 2x = 100$$

$$-2x = -260$$

$$x = 130$$

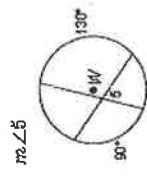
Practice: Find the missing arc or angle measure in each figure.



$$\frac{120}{2} = 60$$

$$160 + m < 4 = 90$$

$$m < 4 = 30$$



$$\frac{130 + 90}{2} = \frac{220}{2} = 110$$

$$180 - 110 = m < 5$$

$$m < 5 = 70$$