## 11.3 Regents: Similar triangles in circles
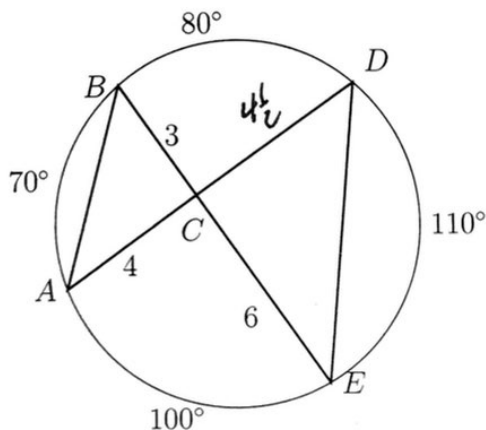
1. As shown, circle $O$ has chords $\overline{AD}$ and $\overline{BE}$ intersecting at $C$, and $m\widehat{AB} = 70°$, $m\widehat{BD} = 80°$, $m\widehat{AE} = 100°$, and $m\widehat{DE} = 110°$. $BC = 3$, $AC = 4$, and $CE = 6$.



80°

D

B

3

4 u

70°

110°

C

4

A

6

E

100°

(a) Write down the measure of angles $\angle B$ and $\angle D$.   $50°$

(b) Write down the measure of angles $\angle A$ and $\angle E$.   $40°$

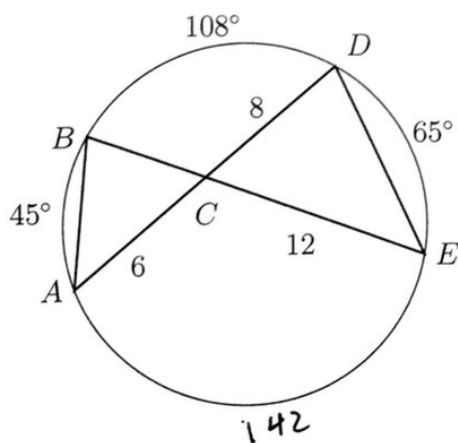(c) Find the measures of the two angles at $C$.

$90°$ & $90°$

(d) Find the scale factor and $CD$.

$$4 \rightarrow 6, \quad k = \frac{6}{4} = \frac{3}{2}$$

$$CD = 3 \times \frac{3}{2} = \frac{9}{2}$$

2. Given circle $O$ with chords $\overline{AD}$ and $\overline{BE}$ intersecting at $C$, as shown in the diagram. Given $m\widehat{AB} = 45°$, $m\widehat{BD} = 108°$, and $m\widehat{DE} = 65°$.



$36°$
$218$

108°

D

8

B

65°

45°

C

12

6

E

A

142

(a) Write down the measure of angles $\angle B$ and $\angle D$.   $71°$

(b) Write down the measure of angles $\angle A$ and $\angle E$.   $54°$

(c) Find the measures of the two angles at $C$.

$m\angle ACB = 180° - (71 + 54) = 55°$

$m\angle BCD = 180 - 55 = 125°$

(d) Find the scale factor and $BC$.

$$6 \rightarrow 12 \qquad k = 2$$

$$BC = \frac{8}{2} = 4$$

The secants $\overline{ABC}$ and $\overline{ADE}$ intersect the circle $O$, as shown in the diagram.
Given $m\widehat{BD} = 28°$ and $m\widehat{CE} = 136°$.

(a) Find the $m\angle CDE$.  $\dfrac{136}{2} = 68°$
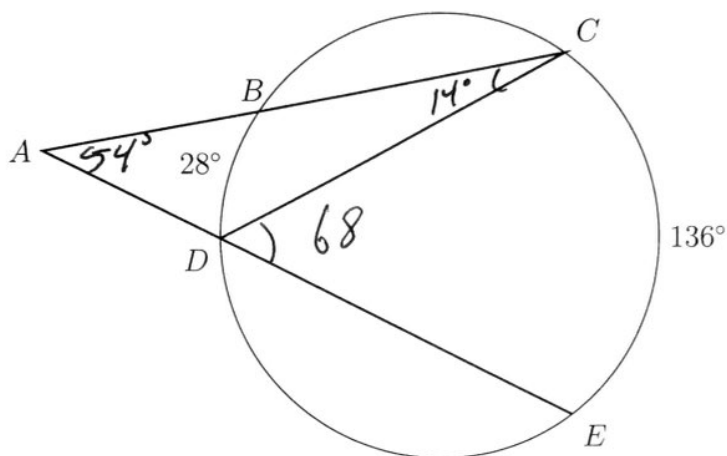
(b) Find the $m\angle C$.  $14$

(c) Find the $m\angle A$.

$m\angle A = 68 - 14$
$= 54°$

C

B

$14°$

A  $54°$  $28°$

$68$

D

$136°$

E

4. The secants $\overline{ABC}$ and $\overline{ADE}$ intersect the circle $O$, as shown in the diagram.
$AB = 10$, $AD = 8$, $AC = 24$. (note: similar triangles)

(a) $\overline{AD} \rightarrow ?$  $\overline{AB}$

(b) $k = \dfrac{10}{8} = \dfrac{5}{4}$

(c) $\overline{AC} \rightarrow ?$  $\overline{AE}$

(d) $AE =$  $24 \cdot \dfrac{5}{4} = 30$

24

10  B

C

A

8

D

$30$

E

2