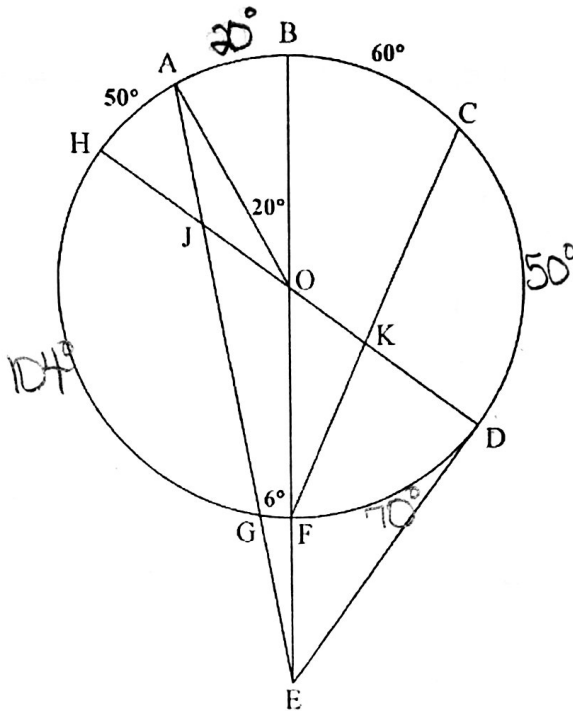


**Big Circle Problem #1**

Given:  $\odot O$   
 $\overline{ED}$  is tangent at D  
 $\angle AOB = 20^\circ$   
 $\widehat{GF} = 6^\circ$   
 $\overline{AH} = 50^\circ$   
 $\widehat{BC} = 60^\circ$

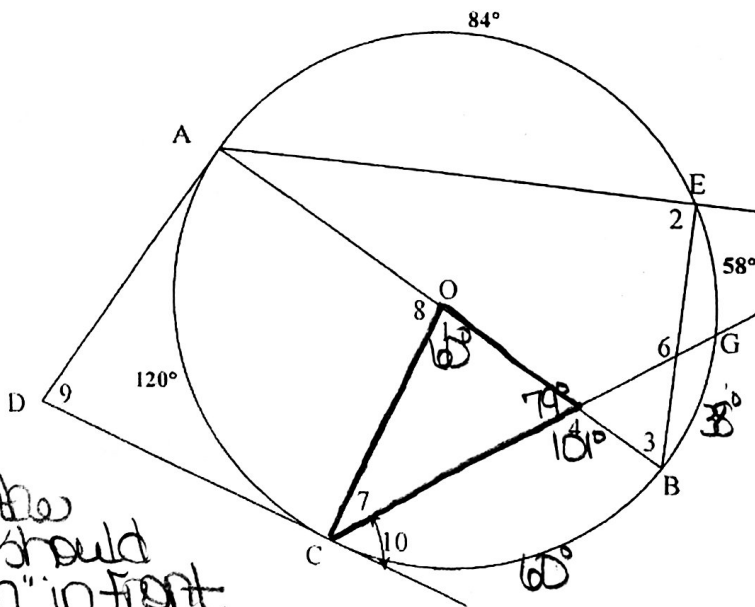


\*Each of the arcs and angles should have "m" in front

1.  $\widehat{AB} = 20^\circ$  front
2.  $\angle BFC = \frac{1}{2}(60^\circ) = 30^\circ$
3.  $\angle CKD = \frac{1}{2}(50^\circ + 110^\circ) = 80^\circ$
4.  $\angle ODE = \frac{1}{2}(180^\circ) = 90^\circ$
5.  $\angle AEB = \frac{1}{2}(20^\circ - 6^\circ) = 7^\circ$
6.  $\widehat{HG} = 180^\circ - (20^\circ + 50^\circ + 6^\circ) = 104^\circ$
7.  $\angle HOF = 110^\circ$
8.  $\widehat{DF} = 180^\circ - (104^\circ + 6^\circ) = 70^\circ$
9.  $\widehat{CD} = 180^\circ - (60^\circ + 70^\circ) = 50^\circ$
10.  $\angle BED = \frac{1}{2}(110^\circ - 70^\circ) = 20^\circ$

**Big Circle Problem #2**

Given:  $\odot O$ ,  $\overline{AB}$  is a diameter,  $\overline{DA}$  and  $\overline{DC}$  are tangents,  $\widehat{AC} = 120^\circ$ ,  $\widehat{AE} = 84^\circ$ ,  $\widehat{EG} = 58^\circ$



- $m\angle 2 = \frac{1}{2}(180^\circ)$
- $m\angle 3 = \frac{1}{2}(84^\circ)$
- $m\angle 4 = \frac{1}{2}(60^\circ + (58^\circ + 84^\circ))$
- $m\angle 5 = \frac{1}{2}(180^\circ - 58^\circ)$
- $m\angle 6 = \frac{1}{2}((60^\circ + 84^\circ) + 38^\circ)$
- $m\angle 9 = \frac{1}{2}((84^\circ + 58^\circ + 38^\circ) + 60^\circ)$
- $m\angle 10 = \frac{1}{2}(38^\circ + 60^\circ)$

\*Each of the angles should have "m" in front

- $\angle 1 = 60^\circ$     $\angle 2 = 90^\circ$     $\angle 3 = 42^\circ$     $\angle 4 = 101^\circ$     $\angle 5 = 31^\circ$   
 $\angle 6 = 121^\circ$     $\angle 7 = 41^\circ$     $\angle 8 = 60^\circ$     $\angle 9 = 60^\circ$     $\angle 10 = 49^\circ$

To find  $m\angle 7$ ,  $m\angle 1 = 60^\circ$ ,  $m\angle 4 = 101^\circ$ , so its linear pair is  $79^\circ$ .  
 All 3 angles of a  $\Delta$  add up to  $180^\circ$ , so  $m\angle 7 = 180^\circ - (60^\circ + 79^\circ)$

$a^\circ = \frac{1}{2}(180^\circ - 112^\circ) = 34^\circ$

$b^\circ = \frac{1}{2}(176^\circ) = 88^\circ$

$c^\circ = \frac{1}{2}(180^\circ - 110^\circ) = 35^\circ$