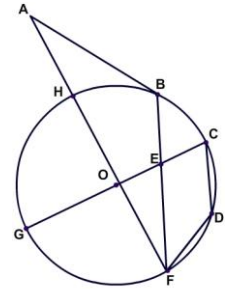
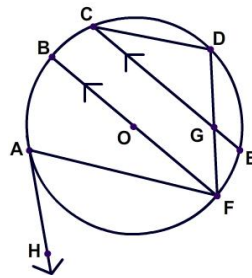
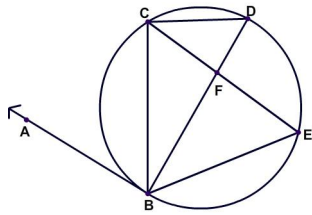


Mixed Review on Formulas & Theorems on Geometry of Circles



Circle Formulas and Theorems : <http://www.mathwarehouse.com/geometry/circle/>

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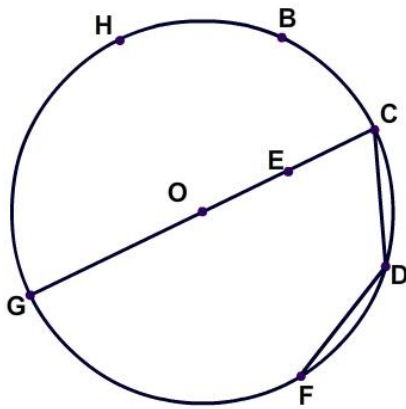
TEACHERS: Feel free to make copies of this worksheet for the sole purpose of use in your own classroom. ENJOY!!! Redistribution in any other form is prohibited.

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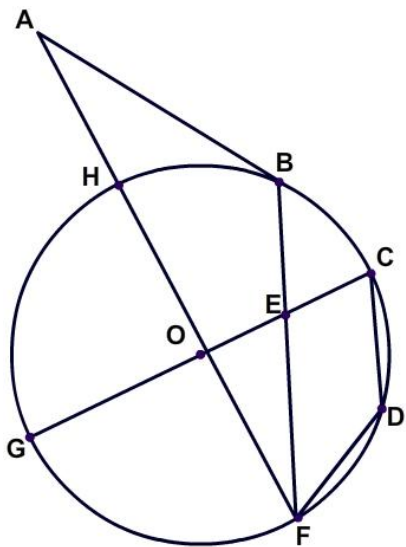
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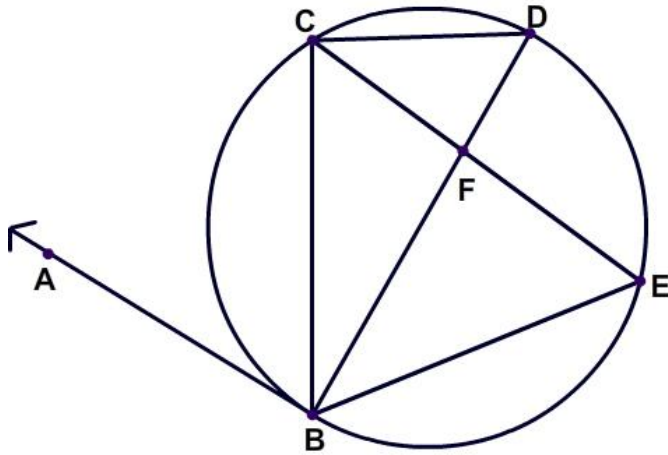
Warm Up: $\widehat{GF} : \widehat{FD} : \widehat{DC} = 4:1:1$, What is $m\angle GCD$?



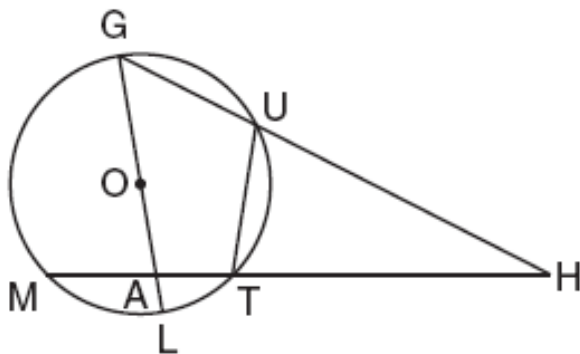
1) \overline{AB} is a tangent. $\widehat{GF} : \widehat{FD} : \widehat{DC} = 4:1:1$, $\angle HFB = 25^\circ$, $\widehat{BC} = 30^\circ$
 Find $m\widehat{GF}$, $m\angle A$, $m\angle BEC$, $m\angle GCD$



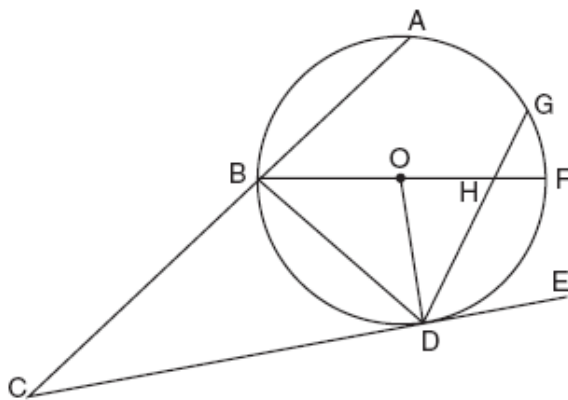
2) \overrightarrow{AB} is a tangent. $\angle ABC = 60^\circ$, $\widehat{CD} = 50^\circ$, $\widehat{DE} : \widehat{EB} = 9 : 10$
 Find $m\angle DCE$, $m\angle CDB$, $m\angle CEB$, $m\angle CFD$.



4) Given circle O with diameter \overline{GOAL} ; secants \overline{HUG} and \overline{HTAM} intersect at point H . $m\widehat{GM} : m\widehat{ML} : m\widehat{LT} = 7 : 3 : 2$; and chord $\overline{GU} \cong \text{chord } \overline{UT}$. Find the ratio of $m\angle UGL$ to $m\angle H$.

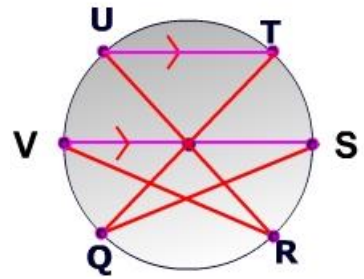


- 5) In the accompanying diagram, circle O has radius \overline{OD} , diameter \overline{BOHF} , secant \overline{CBA} , and chords \overline{DHG} and \overline{BD} ; \overline{CE} is tangent to circle O at D ; $m\widehat{DF} = 80$; and $m\widehat{BA} : m\widehat{AG} : m\widehat{GF} = 3 : 2 : 1$.
Find $m\widehat{GF}$, $m\angle BHD$, $m\angle BDG$, $m\angle GDE$, $m\angle C$, and $m\angle BOD$.



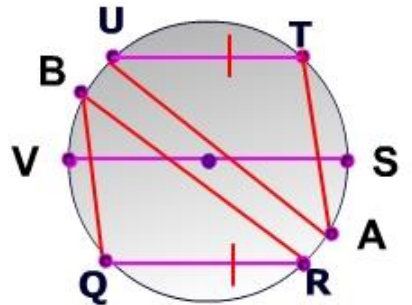
6) UR and TQ are chords. $m\angle UT = 52^\circ$

What is the measure of $\angle QR$, $\angle UV$, $\angle TS$, $\angle TQS$, $m\angle URV$?



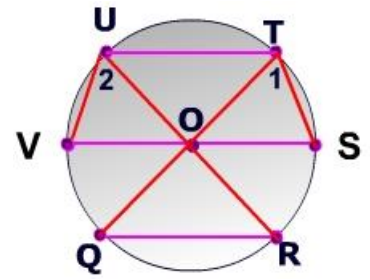
7) $m\angle QR = 80^\circ$

What is the measure of $\angle UAT$, $\angle QBR$, $\angle UT$?



8) $\angle 1 \cong \angle 2$ and $\angle QOR = 70^\circ$

What is the measure of $\angle 1$, $\angle 2$, $\angle QOR$

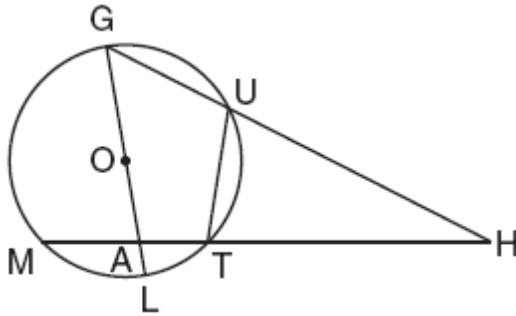


Is $VS \parallel QR$? Explain your answer?

Question 4 and 5 were taken from jmap.org . Included below are the worked out answers provided from that excellent website.

4

Given circle O with diameter \overline{GOAL} ; secants \overline{HUG} and \overline{HTAM} intersect at point H ; $m\overline{GM} : m\overline{ML} : m\overline{LT} = 7 : 3 : 2$; and chord $\overline{GU} \cong \text{chord } \overline{UT}$. Find the ratio of $m\angle UGL$ to $m\angle H$.

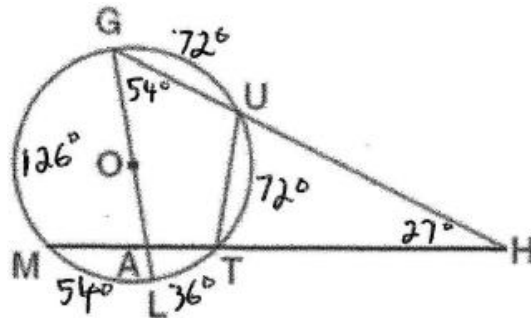


\overline{GM} and \overline{ML} form a semi-circle and measure 126° ($\frac{7}{10} \times 180$) and 54° ($\frac{3}{10} \times 180$), respectively. \overline{LT} measures 36° . \overline{GM} and \overline{ML} form a semi-circle and measure 126° . $\angle GUT$ measures 144° ($180 - 36$). Equal chords intercept equal arcs. Because chord $\overline{GU} \cong \text{chord } \overline{UT}$, \overline{GU} and \overline{UT} each measures 72° ($\frac{144}{2}$). $m\angle UTL = 108$ ($72 + 36$). The measure of an inscribed angle is half that of its intercepted arc. So $m\angle UGL = 54$.

The angle formed by a tangent and a secant is equal to half the difference between the intercepted arcs:

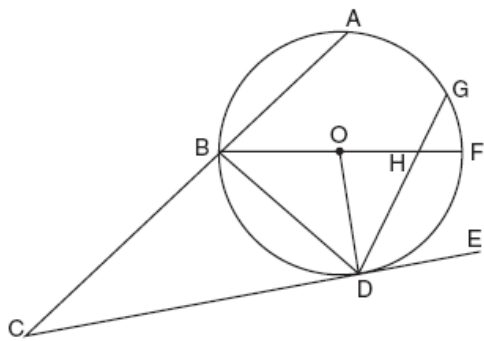
$$\frac{126 - 72}{2} = 27$$

The ratio of $m\angle UGL$ to $m\angle H$ is 54:27, or 2:1.



5

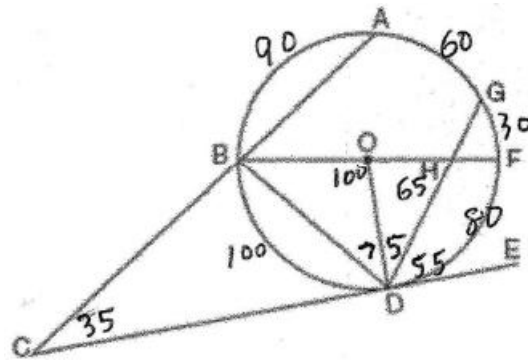
In the accompanying diagram, circle O has radius \overline{OD} , diameter \overline{BOHF} , secant \overline{CBA} , and chords \overline{DHG} and \overline{BD} ; \overline{CE} is tangent to circle O at D ; $m\widehat{DF} = 80$; and $m\widehat{BA} : m\widehat{AG} : m\widehat{GF} = 3 : 2 : 1$.
 Find $m\widehat{GF}$, $m\angle BHD$, $m\angle BDG$, $m\angle GDE$, $m\angle C$, and $m\angle BOD$.



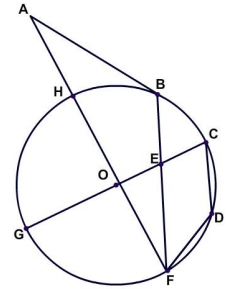
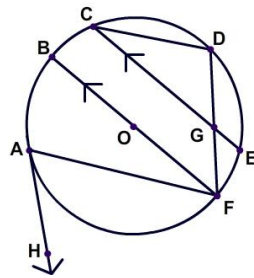
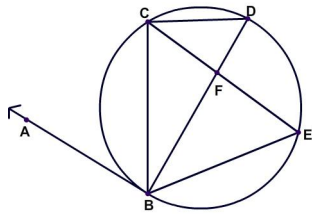
\widehat{BA} , \widehat{AG} and \widehat{GF} form a semi-circle and measure 90° ($\frac{3}{6} \times 180$), 60° ($\frac{2}{6} \times 180$) and 30° ($\frac{1}{6} \times 180$), respectively. The measure of an inscribed angle is half that of its intercepted arc. So $m\angle BDG = 75$ ($\frac{90+60}{2}$) and $m\angle HBD = 40$ ($\frac{80}{2}$). Therefore $m\angle BHD = 65$ ($180 - (75 + 40)$). The angle formed by a tangent and a chord is half the intercepted arc. Since the intercepted arc is 110° ($80 + 30$), $m\angle GDE = 55$. Given diameter \overline{BOHF} and $m\widehat{DF} = 80$, $m\widehat{BD} = 100$. The angle formed by a tangent and a secant is equal to half the difference between the intercepted arcs, so $m\angle C$:

$$\frac{(60 + 30 + 80) - 100}{2} = 35$$

The measure of a central angle is equal to the measure of the arc it intercepts, so $m\angle BOD = 100$.



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