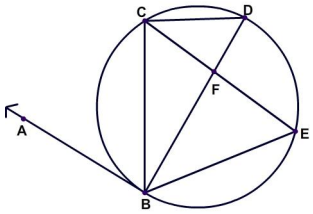
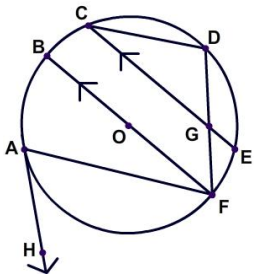
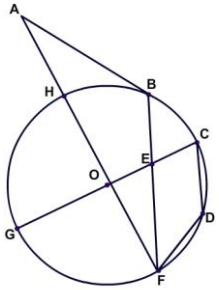
Mixed Review on Formulas & Theorems on Geometry of Circles







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

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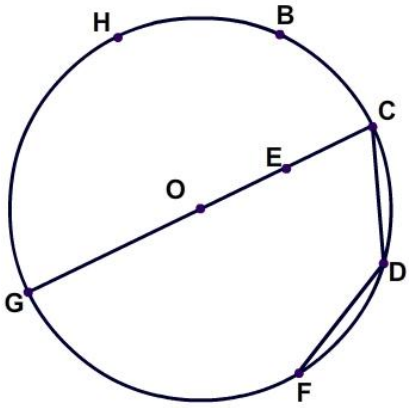
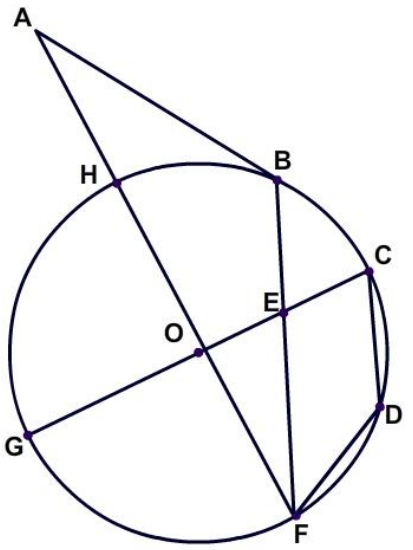
Warm Up: $\overset{\frown}{GF} : \overset{\frown}{FD} : \overset{\frown}{DC} = 4:1:1$, What is m$\angle GCD$?



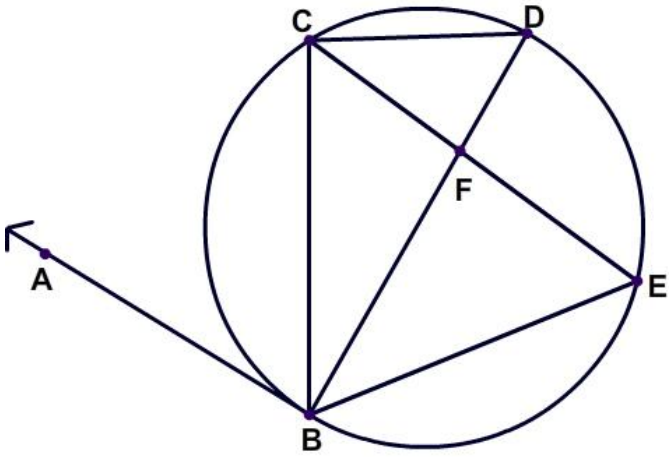
1) $\overline{AB}$ is a tangent. $\overset{\frown}{GF} : \overset{\frown}{FD} : \overset{\frown}{DC} = 4:1:1$, $\angle HFB = 25°$, $\overset{\frown}{BC} = 30°$

Find m $\overset{\frown}{GF}$, m $\angle A, m\angle BEC, m\angle GCD$



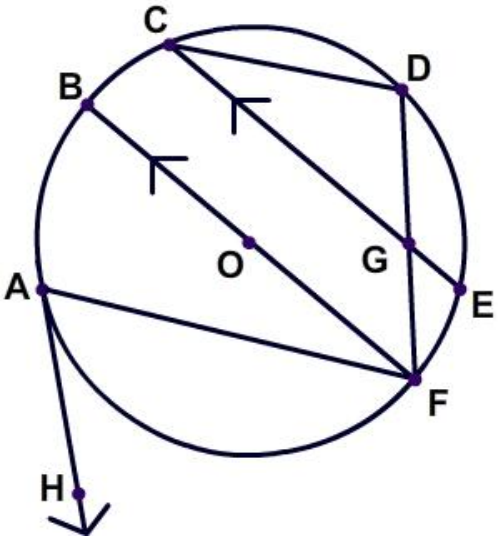
2) $\overrightarrow{AB}$ is a tangent. $\angle ABC=60°$, $\overset{\frown}{CD}=50°$, $\overset{\frown}{DE}:\overset{\frown}{EB}=9:10$

Find $m\angle DCE$, $m\angle CDB$, $m\angle CEB$, $m\angle CFD$.

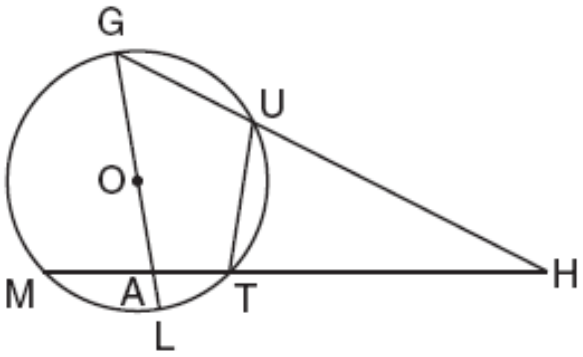


3) $\overleftrightarrow{AH}$ is a tangent, $\overline{BOF}$ is a diameter $BF \parallel CE$, $m\angle FAH = 70°, \overset{\frown}{CDE} = 100°$

Find the measure of $\overset{\frown}{FA}$, $\overset{\frown}{BA}$, $\overset{\frown}{BC}$, $\overset{\frown}{EF}$, $m\angle CDF$, $m\angle AFD$

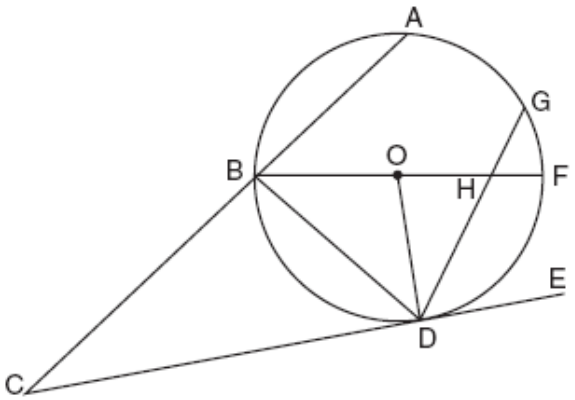


4) Given circle O with diameter $\overline{GOAL}$; secants $\overline{HUG}$ and $\overline{HTAM}$ intersect at point H. $m\overset{\frown}{GM} : m\overset{\frown}{ML} : m\overset{\frown}{LT} = 7:3:2$; and chord $\overline{GU} \cong$ chord $\overline{UT}$. Find the ratio of $m\angle UGL$ to $m\angle H$.



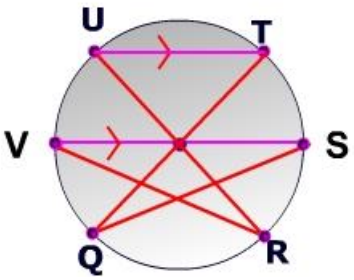
5) In the accompanying diagram, circle O has radius $\overline{OD}$, diameter $\overline{BOHF}$, secant $\overline{CBA}$, and chords $\overline{DHG}$ and $\overline{BD}$; $\overline{CE}$ is tangent to circle O at D; $m\widehat{DF} = 80$; and $m\widehat{BA} : m\widehat{AG} : m\widehat{GF} = 3 : 2 : 1$.

Find $m\widehat{GF}$, $m\angle BHD$, $m\angle BDG$, $m\angle GDE$, $m\angle C$, and $m\angle BOD$.



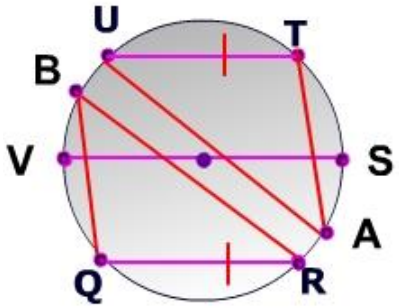
6) UR and TQ are chords. M $\overset{\frown}{UT} = 52^{o}$

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

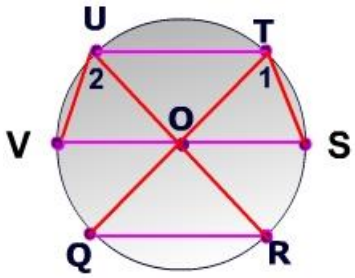


7) M $\overset{\frown}{QR} = 80^{o}$

What is the measure of $\angle UAT, \angle QBR, \overset{\frown}{UT}$?



8) $\angle 1 \cong \angle 2$ and $QR = 70^{o}$



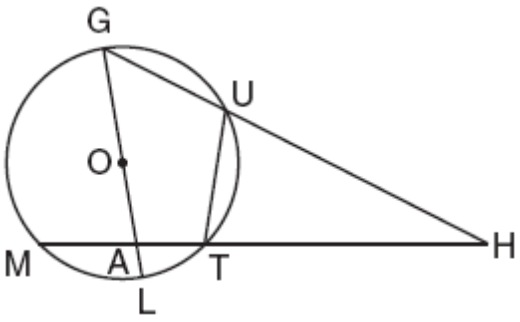
What is the measure of $\angle 1$, $\angle 2$, $\angle QOR$

Is VS || 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; $mGM : mML : mLT = 7:3:2$; and chord $\overline{GU} \cong$ chord $\overline{UT}$. Find the ratio of $m\angle UGL$ to $m\angle H$.



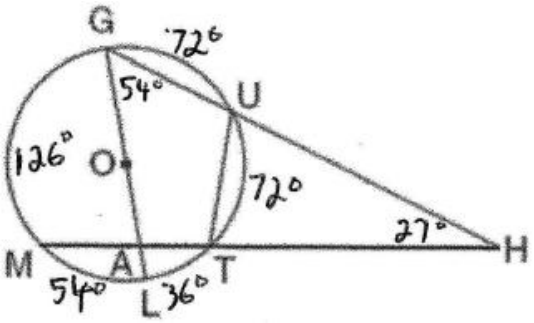
GM and ML form a semi-circle and measure 126° $(\frac{7}{10} \times 180)$ and 54° $(\frac{3}{10} \times 180)$, respectively. LT measures 36°. GM and ML form a semi-circle and measure 126°. GUT measures 144° $(180 - 36)$. Equal chords intercept equal arcs. Because chord $\overline{GU} \cong$ chord $\overline{UT}$, GU and UT each measures 72° $(\frac{144}{2})$.

$mUTL = 108$ $(72 + 36)$. 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:

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

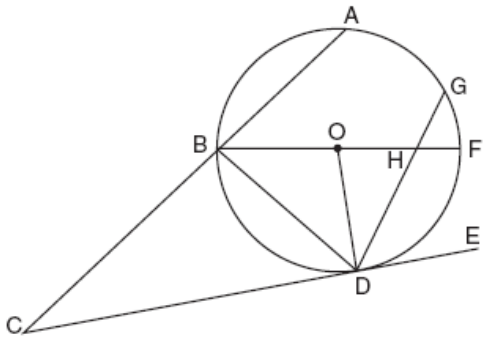
The ratio of $m\angle UGL$ to $m\angle H$ is 54:27, or 2:1.



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; $mDF = 80$; and $mBA : mAG : mGF = 3 : 2 : 1$.

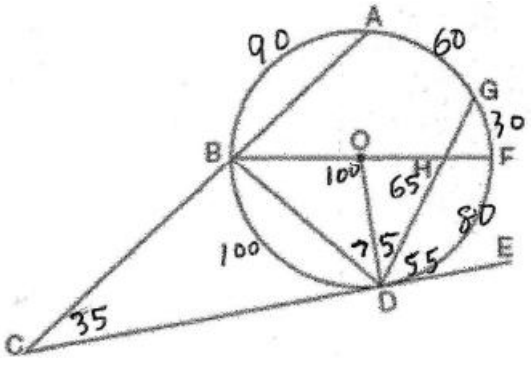
Find mGF, $m\angle BHD$, $m\angle BDG$, $m\angle GDE$, $m\angle C$, and $m\angle BOD$.



BA, AG and 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 $mDF = 80$, $mBD = 100$. 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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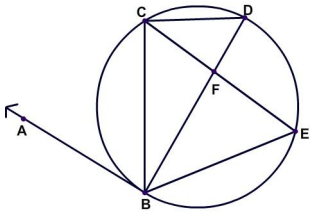

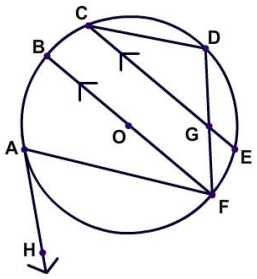

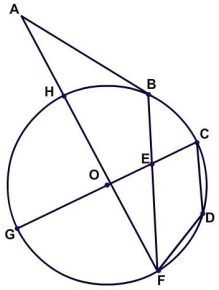

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