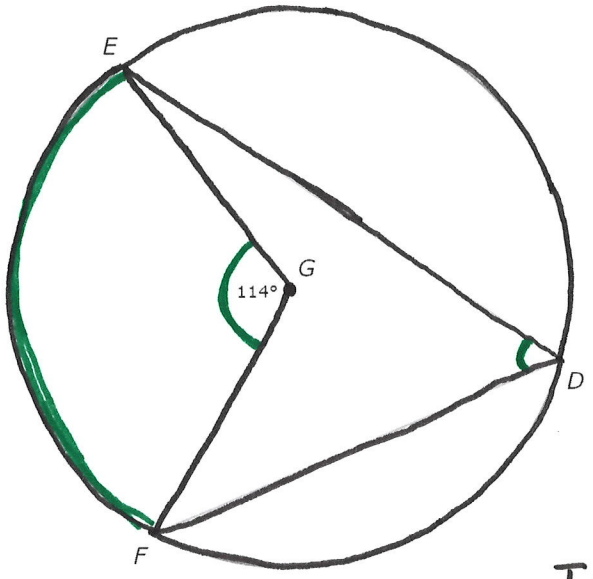
Worked Examples - Inscribed Angles (IXL Geometry W.12)

1.

What is $m\angle EDF$?



114°

$\frac{114}{2} = m\angle EDF$

$57° = m\angle EDF$

Inscribed Angle – Angle whose vertex is on a circle, whose sides are chords.

Intercepted Arc – An arc that lies between 2 sides of an angle.

Inscribed Angle Theorem – Measure of an inscribed angle is half the measure of the central that intercepts the same arc.

Given Central ∠

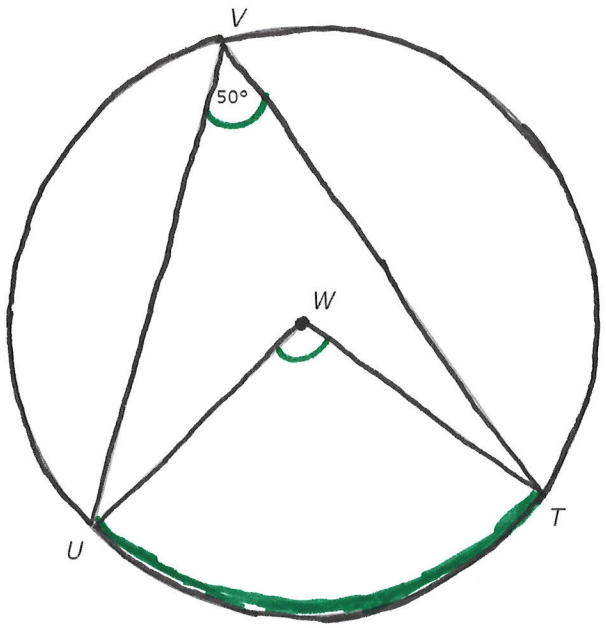
$\frac{\text{central } \angle}{2} = \text{Inscribed } \angle$

Given Inscribed ∠

$2(\text{Inscribed } \angle) = \text{central } \angle$

2.

What is $m\angle W$?



Given Inscribed

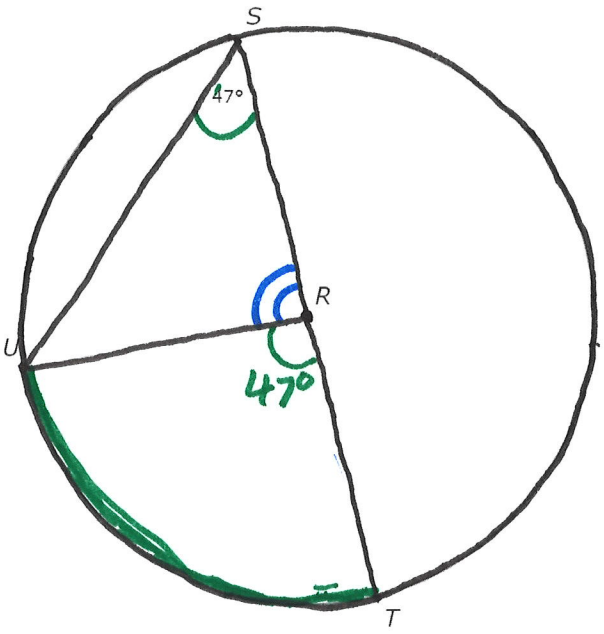
$2(m\angle V) = m\angle W$

$2(50°) = m\angle W$

$100° = m\angle W$

3.

What is $m\angle SRU$?



Given Inscribed

$2(m\angle S) = m\angle URT$

$2(47) = m\angle URT$

$94 = m\angle URT$

$\overline{ST}$ is a diameter

Arc of diameter is 180°.

supplementary angles →

$m\angle TRU + m\angle SRU = 180°$

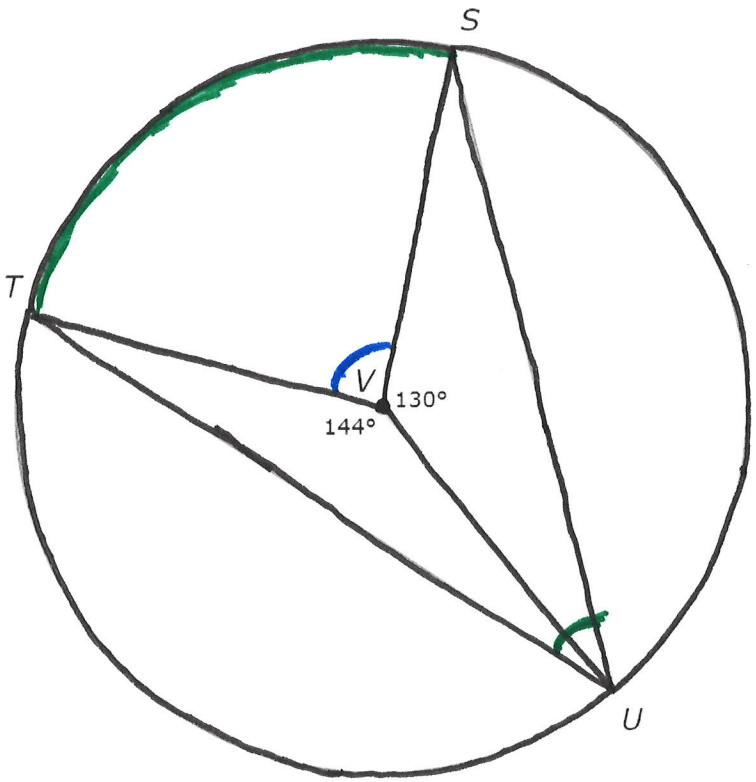
$94 + m\angle SRU = 180°$

$-94 \qquad -94$

$m\angle SRU = 86°$

4.

What is $m\angle SUT$?



Write your answer as an integer or decimal.

The central ∠s of a circle add to 360°

$144 + 130 + m\angle SVT = 360$

$274 + m\angle SVT = 360$

$-274 \quad -274$

$m\angle SVT = 86°$

Have a central ∠

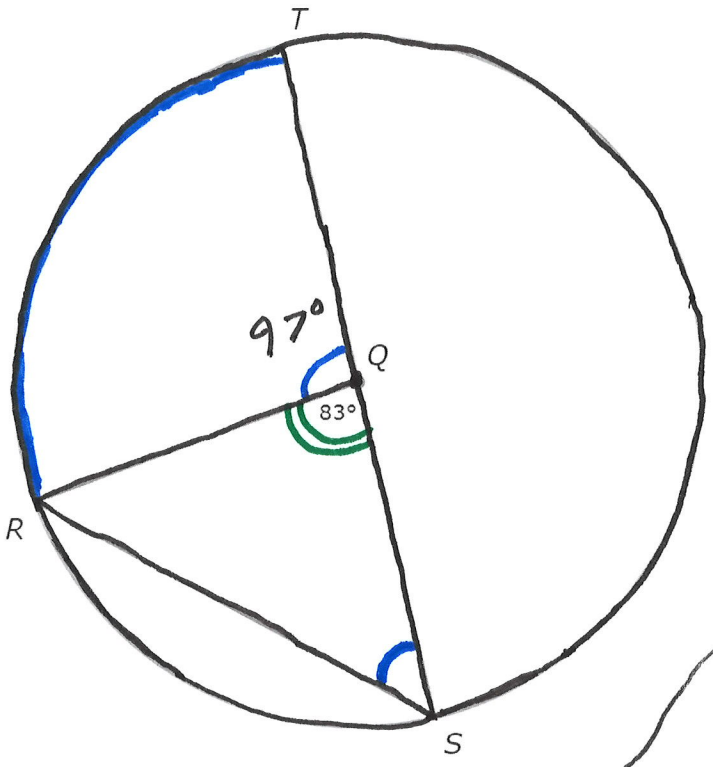
$\frac{m\angle SVT}{2} = m\angle SUT$

$\frac{86}{2} = m\angle SUT$

$43° = m\angle SUT$

5.

What is $m\angle RST$?



ST is a diameter.

$m\angle SQT = 180°$

$m\angle SQR + m\angle RQT = 180°$

$83 + m\angle RQT = 180$

$-83 \quad -83$

$m\angle RQT = 97°$

Write your answer as an integer or decimal.

Have a central $\angle$

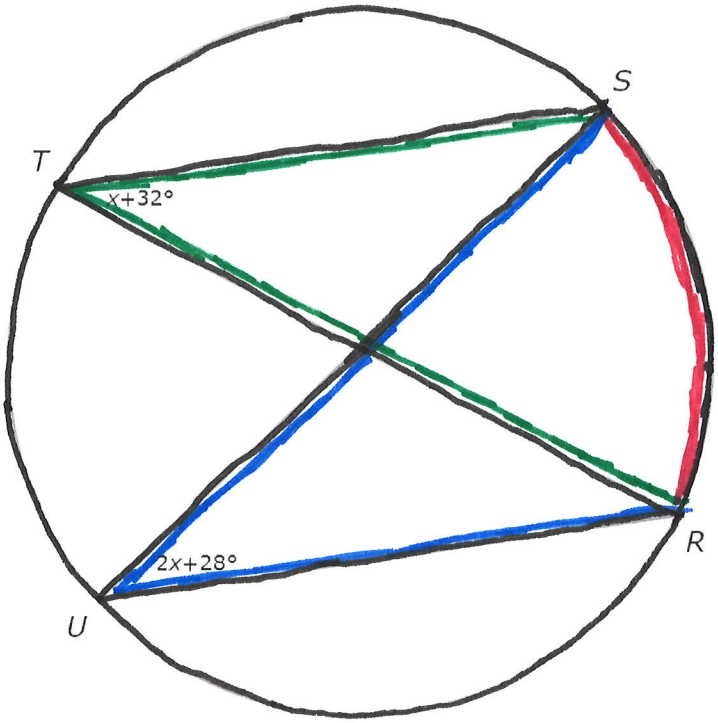
$\frac{m\angle RQT}{2} = m\angle RST$

$\frac{97}{2} = m\angle RST$

$48.5° = m\angle RST$

6.

What is the value of x?



2 Inscribed ∠s intercept the same arc are ≅

$\angle STR \cong \angle SUR$

$m\angle STR = m\angle SUR$

$x + 32 = 2x + 28$

$-x \qquad -x$

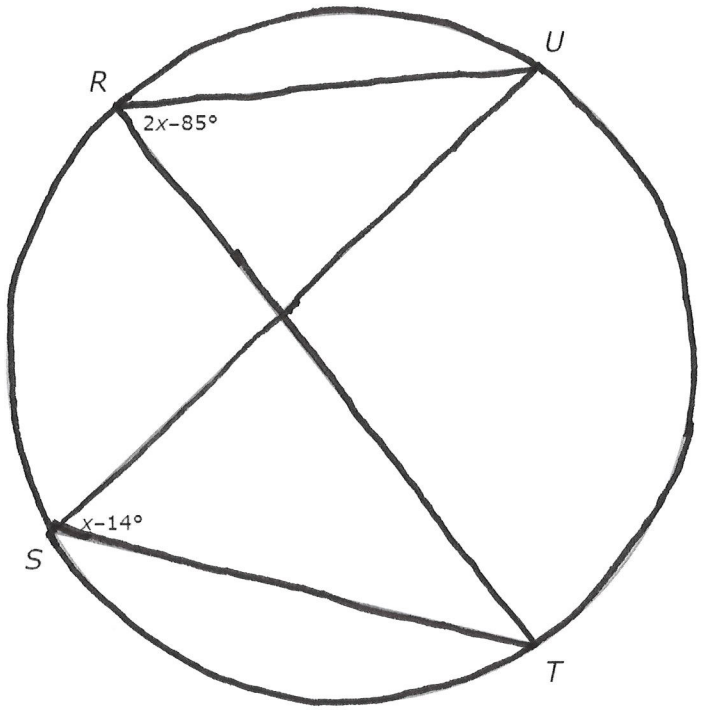
$32 = x + 28$

$-28 \qquad -28$

$\boxed{4 = x}$

7.

What is $m\angle S$?



$\angle S$ and $\angle R$ both intercept $\overset{\frown}{TU}$, and are inscribed.

$\angle S \cong \angle R$

$m\angle S = m\angle R$

$x - 14 = 2x - 85$

$+85 \qquad +85$

$x + 71 = 2x$

$-x \qquad -x$

$71 = x$

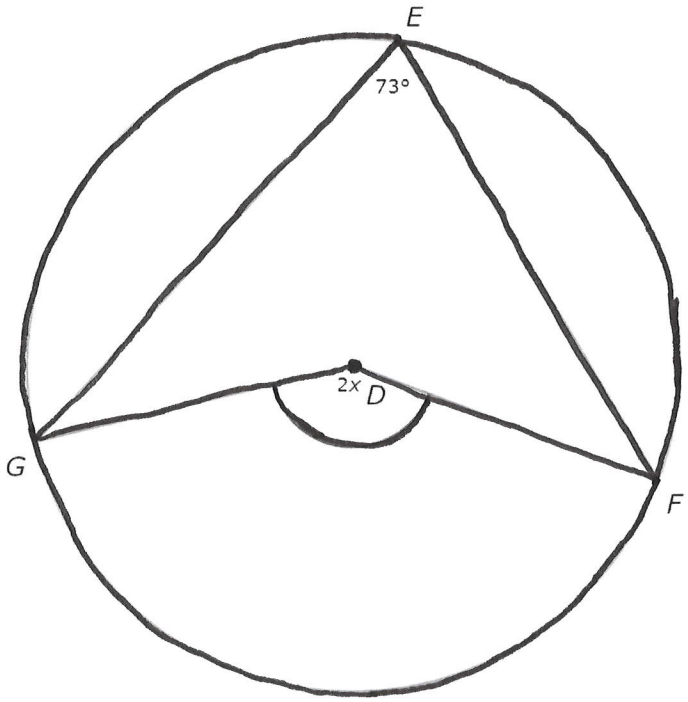
$m\angle S = x - 14$

$m\angle S = 71 - 14$

$\boxed{m\angle S = 57°}$

8.

What is the value of x?



Inscribed ∠ Thm.

$2(m\angle E) = m\angle D$

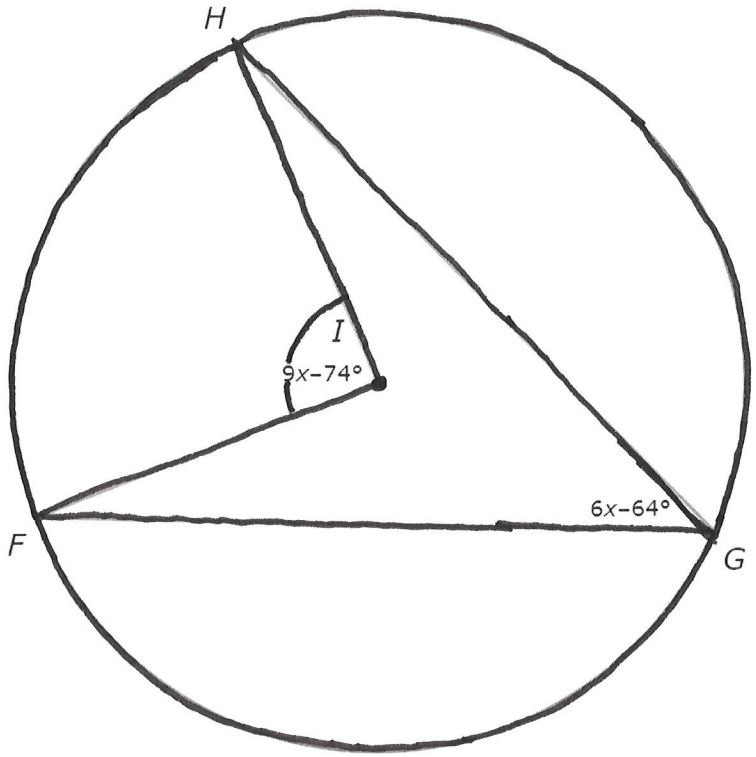
$2(73) = 2x$

$\frac{146}{2} = \frac{2x}{2}$

$\boxed{73 = x}$

9.

What is $m\angle FGH$?



$m\angle G$ and $m\angle I$

$\angle G$ is inscribed & $\angle I$ is central.

$\overset{\frown}{FH}$ is intercepted arc.

$2(m\angle G) = m\angle I$

$2(6x-64) = 9x-74$

$12x - 128 = 9x - 74$

$+128 \qquad +128$

$12x = 9x + 54$

$-9x \quad -9x$

$3x = 54$

$x = 18$

$m\angle FGH = 6x-64$

$m\angle FGH = 6(18) - 64$

$\boxed{m\angle FGH = 44°}$