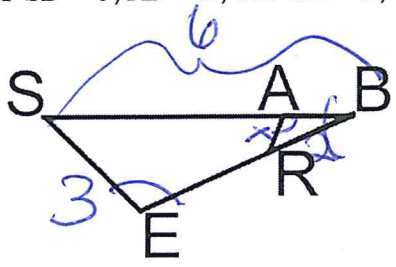
- Separate the triangles
- Draw them with the same orientation
- write the corresponding angles in the same position

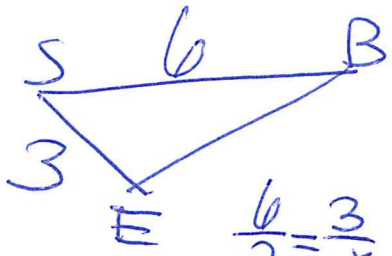
Name Schlansky
Mr. Schlansky

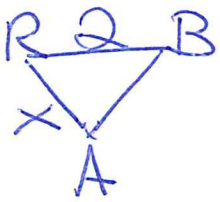
Date _____
Geometry

Overlapping Similar Triangles

1. In triangle SEB, A is on $\overline{SB}$, and E is on $\overline{EB}$ so that $\angle E \cong \angle BAR$.
If $\overline{SB} = 6$, $\overline{RB} = 2$, and $\overline{SE} = 3$, find $\overline{RA}$.





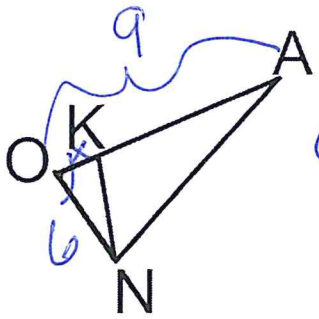


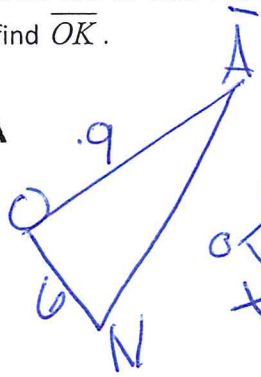
$\frac{6}{2} = \frac{3}{x}$

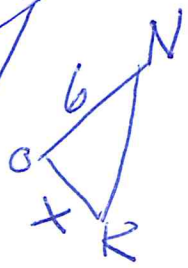
$\frac{6x}{6} = \frac{6}{6}$ → $x = 1$

$\overline{RA} = 1$

2. In triangle AON, K is on $\overline{AO}$ so that $\angle A \cong \angle ONK$.
If $\overline{ON} = 6$ and $\overline{OA} = 9$, find $\overline{OK}$.







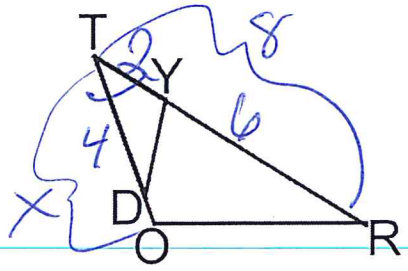
$\frac{9}{6} = \frac{6}{x}$

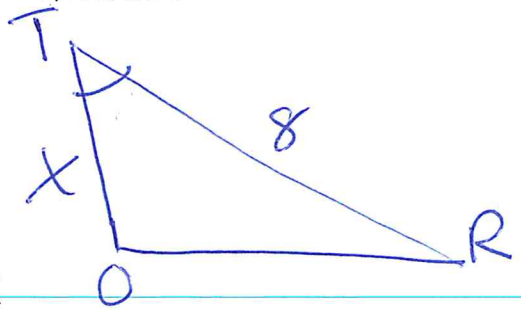
$\frac{9x}{9} = \frac{36}{9}$

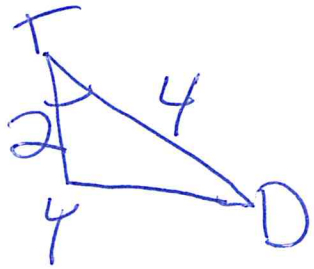
$x = 4$

$\overline{OK} = 4$

3. In triangle TOR, Y is on $\overline{TR}$, and D is on $\overline{TO}$ so that $\angle TYD \cong \angle ROT$.
If $\overline{TY} = 2$, $\overline{YR} = 6$, and $\overline{TD} = 4$, find $\overline{TO}$.







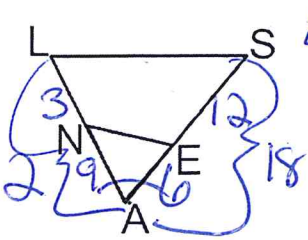
$\frac{x}{2} = \frac{8}{4}$

$\frac{4x}{4} = \frac{16}{4}$

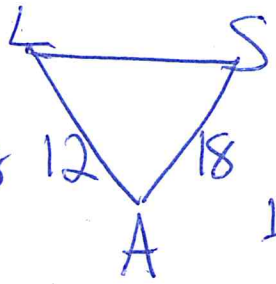
$x = 4$

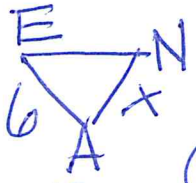
$\overline{TO} = 4$

4. In triangle SAL, N is on $\overline{LA}$, and E is on $\overline{AS}$ so that $\angle AEN \cong \angle L$.
If $\overline{AE} = 6$, $\overline{ES} = 12$, and $\overline{ES} \cong \overline{AL}$, find $\overline{NL}$.



12 − 9 = 3





$\frac{12}{6} = \frac{18}{x}$

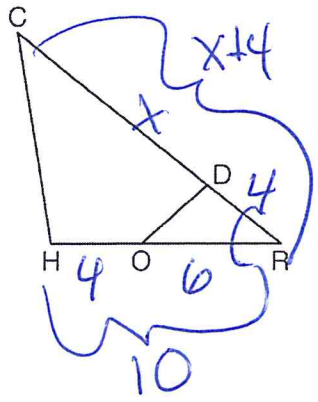
$12x = 108$

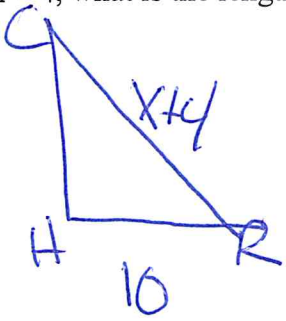
$\frac{12x}{12} = \frac{108}{12}$

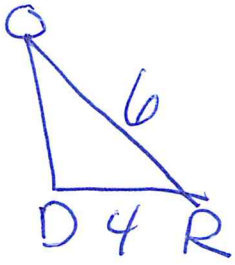
$x = 9$

$NL = 3$

5. In triangle CHR, O is on $\overline{HR}$, and D is on $\overline{CR}$ so that $\angle H \cong RDO$.
If $RD = 4$, $RO = 6$, and $OH = 4$, what is the length of $\overline{CD}$?







$\frac{x+4}{6} = \frac{10}{4}$

$60 = 4(x+4)$

$60 = 4x + 16$

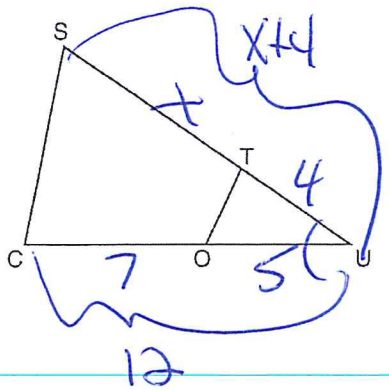
$-16 \quad -16$

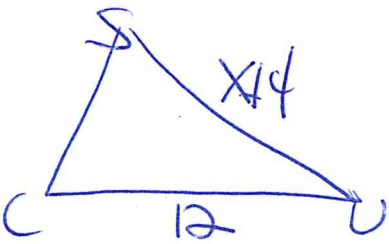
$\frac{44}{4} = \frac{4x}{4}$

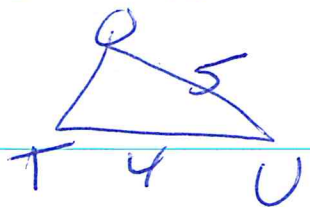
$11 = x$

$CD = 11$

6. In $\triangle SCU$ shown below, points T and O are on $\overline{SU}$ and $\overline{CU}$, respectively. Segment OT is drawn so that $\angle C \cong \angle OTU$.
If $TU = 4$, $OU = 5$, and $OC = 7$, what is the length of $\overline{ST}$?







$\frac{x+4}{5} = \frac{12}{4}$

$4(x+4) = 60$

$4x + 16 = 60$

$-16 \quad -16$

$\frac{4x}{4} = \frac{44}{4}$

$x = 11$

$ST = 11$