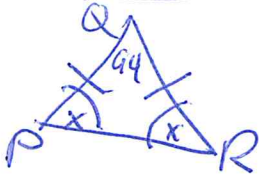# Isosceles Triangles, Angle Bisectors, and Equilateral Triangles

1. In $\triangle XYZ$, $\overline{XY} \cong \overline{YZ}$. If $m\angle Z = 41°$, find the measure of $\angle Y$.
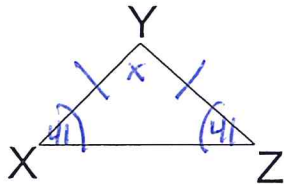
$x+41+41=180$
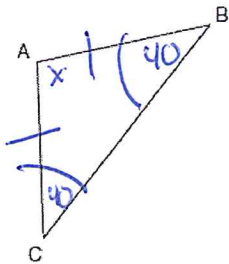$x+82=180$
$-82 \quad -82$
$x=98$

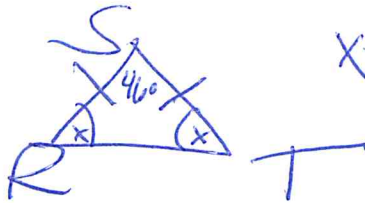2. In $\triangle PQR$, $\overline{PQ} \cong \overline{QR}$. If $m\angle PQR = 94°$, find the measure of $\angle QPR$.

$x+x+94=180$
$2x+94=180$
$-94 \quad -94$
$\frac{2x=86}{2}$
$x=43$

3. In the diagram of $\triangle ABC$ below, $\overline{AB} \cong \overline{AC}$. The measure of $\angle B$ is 40°.
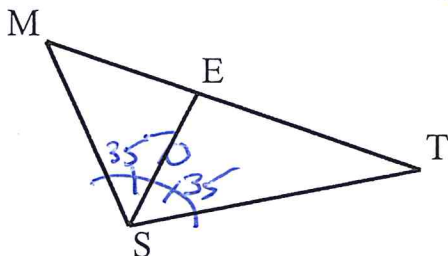What is the measure of $\angle A$?

$x+40+40=180$
$x+80=180$
$-80 \quad -80$
$x=100$

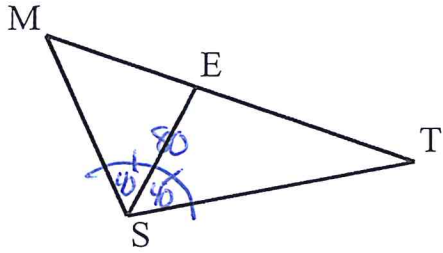4. In $\triangle RST$, $m\angle RST = 46$ and $\overline{RS} \cong \overline{ST}$. Find $m\angle STR$.

$x+x+46=180$
$2x+46=180$
$-46 \quad -46$
$\frac{2x=134}{2}$
$x=67$

5. In the diagram below of $\triangle MST$, $\overline{ES}$ bisects $\angle MST$. If $m\angle MST = 70$, find $\angle MSE$ and $\angle TSE$.
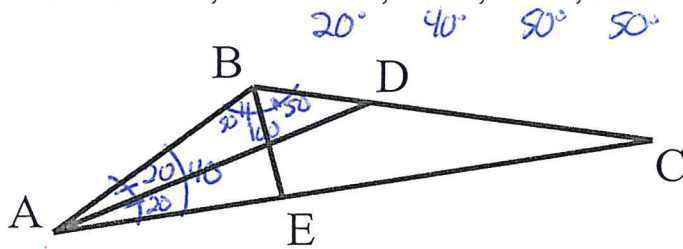
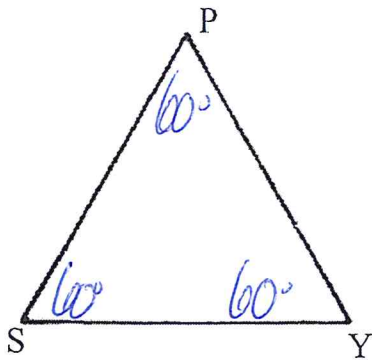$35 \qquad 35$

6. In the diagram below of $\triangle MST$, $\overline{ES}$ bisects $\angle MST$. If $m\angle MSE = 40$, find $\angle TSE$ and $\angle TSM$.

40   80

7. In the diagram below of $\triangle ABC$, $\overline{DA}$ bisects $\angle BAC$ and $\overline{BE}$ bisects $\angle ABC$. If $\angle BAD = 20$ and $\angle ABC = 100$, find $\angle CAD, \angle CAB, \angle ABE, \angle CBE$.

20°   40°   50°   50°

8. In the diagram below, $\triangle SPY$ is equilateral. Find the measure of $\angle S, \angle P, \angle Y$.

60° 60° 60°

9. In the diagram below, $\triangle SPY$ is equilateral and $\overline{ZY}$ bisects $\angle PYS$. Find the measure of $\angle PYZ$.

30°