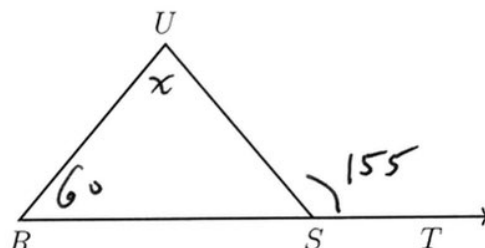


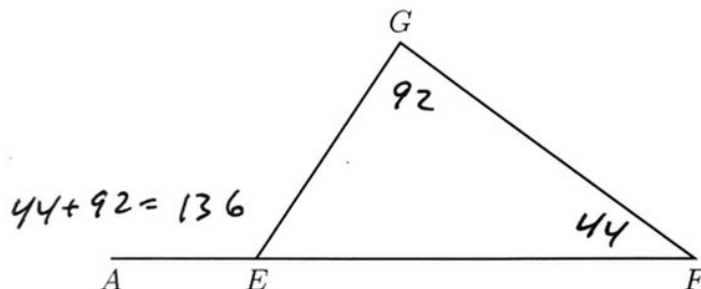
### 3.5 Homework: External angles of triangles

1. Given  $\triangle RSU$ . If  $m\angle UST = 155^\circ$  and  $m\angle R = 60^\circ$ , find  $m\angle U$ .

$$\begin{aligned}x + 60 &= 155 \\x &= 95\end{aligned}$$



2. Given  $\triangle EFG$  with  $\overline{EF}$  extended to A. If  $m\angle F = 44^\circ$  and  $m\angle G = 92^\circ$ , find  $m\angle AEG$ .



$$44 + 92 = 136$$

3. The measures in degrees of the three angles of a triangle are  $x$ ,  $\frac{1}{2}x$ , and  $\frac{3}{2}x$ . Find the measures of the triangle's angles.

$$x + \frac{1}{2}x + \frac{3}{2}x = 180$$

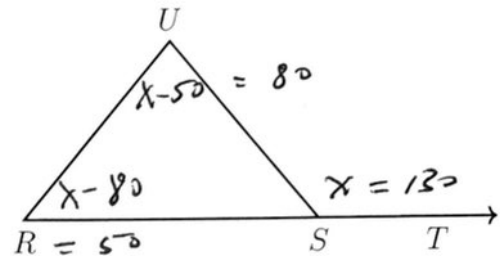
$$3x = 180$$

$$x = 60$$

$$60, 30, 90$$

4. Given  $\triangle RSU$ . If  $m\angle UST = x$  and  $m\angle R = x - 80$ , and  $m\angle U = x - 50$ . Find  $x$

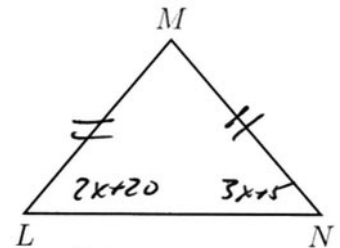
$$\begin{aligned}(x-50) + (x-80) &= x \\ 2x - 130 &= x \\ x &= 130\end{aligned}$$



✓

5. Given isosceles  $\triangle LMN$  with  $\overline{LM} \cong \overline{NM}$ . If  $m\angle L = 2x + 20$  and  $m\angle N = 3x + 5$ , find  $m\angle M$ .

$$\begin{aligned}2x + 20 &= 3x + 5 \\ 15 &= x\end{aligned}$$

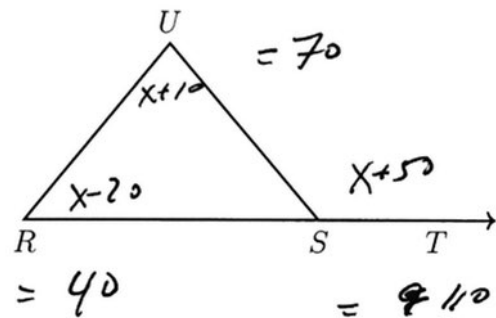


$$\begin{aligned}2(15) + 20 &= 3(15) + 5 \\ 50 &= 50\end{aligned}$$

$$m\angle M = 180 - 50 - 50 = 80$$

6. Given  $\triangle RSU$ . If  $m\angle UST = x + 50$ ,  $m\angle R = x - 20$ , and  $m\angle U = x + 10$ , find  $m\angle R$ .

$$\begin{aligned}(x+10) + (x-20) &= x+50 \\ 2x - 10 &= x+50 \\ x &= 60\end{aligned}$$

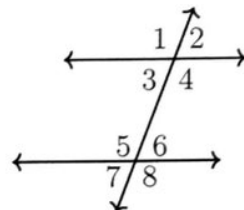


$$40 + 70 = 110 \quad \checkmark$$

### 3.6 Classwork: Parallel lines and transversal situations

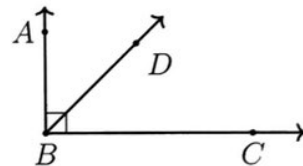
1. Do Not Solve. Circle the appropriate equation, cite a justification:

- "vertical  $\angle$ s are  $\cong$ "
- "definition of bisector"
- "linear pairs sum to  $180^\circ$ "
- "triangle external angle theorem"
- "corresponding  $\angle$ s of  $\parallel$  lines are  $\cong$ "
- "alternate interior  $\angle$ s are  $\cong$ "
- "same-side interior  $\angle$ s are supplementary"



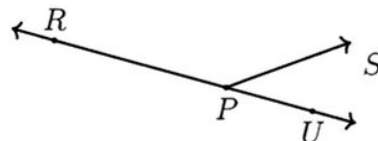
(a) Given two parallel lines intersect a transversal, as shown.

$\angle 2 \cong \angle 6$   $m\angle 2 + m\angle 6 = 180$  Corresponding angles



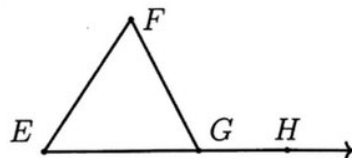
(b) Given  $\overrightarrow{BA} \perp \overrightarrow{BC}$ , with  $\overrightarrow{BD}$  bisecting  $\angle ABC$ .

$\angle ABD \cong \angle DBC$   $m\angle ABD + m\angle DBC = 180$  bisector



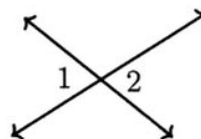
(c)  $\overrightarrow{RP}$  with ray  $\overrightarrow{PS}$ .

$\angle RPS \cong \angle SPU$   $m\angle RPS + m\angle SPU = 180^\circ$  Linear pair



(d) Given  $\triangle EFG$ , with side extended as  $\overrightarrow{EGH}$ .

$\angle E \cong \angle F$   $m\angle E + m\angle F = m\angle FGH$   $\triangle$  exterior angle



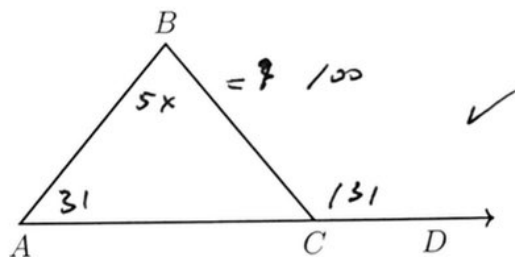
(e) Given  $m\angle 1 = 4x + 6$ ,  $m\angle 2 = 6x - 32$ . Find  $m\angle 1$ .

$\angle 1 \cong \angle 2$   $m\angle 1 + m\angle 2 = 180$  Vertical angles

2. Given  $\triangle ABC$  with side  $\overline{AC}$  extended through  $D$  as shown. Find  $x$  if  $m\angle A = 31$ ,  $m\angle B = 5x$ , and  $m\angle BCD = 131$ .

$$5x + 31 = 131$$

$$x = 20$$



3. The measures in degrees of the three angles of a triangle are  $2x$ ,  $\frac{7}{6}x$ , and  $\frac{4}{3}x$ . Find the measures of the triangle's angles.

$$2x + \frac{7}{6}x + \frac{4}{3}x = 180$$

$$\left(2 + \frac{7}{6} + \frac{4}{3}\right)x = 180$$

$$\frac{9}{2}x = 180$$

$$x = 40$$

$$2x = 80$$

$$\frac{7}{6}x = 46\frac{2}{3}$$

$$\frac{4}{3}x = 53\frac{1}{3}$$

$$80 + 46\frac{2}{3} + 53\frac{1}{3} = 180$$

4. Given isosceles  $\triangle JKL$  with  $\overline{JL} \cong \overline{KL}$ , and  $m\angle J = 5x - 12$  and  $m\angle K = 3x + 16$ .

(a) Mark the congruent sides and angles of the triangle

(b) Find  $m\angle L$

$$3x + 16 = 5x - 12$$

$$28 = 2x$$

$$x = 14$$

