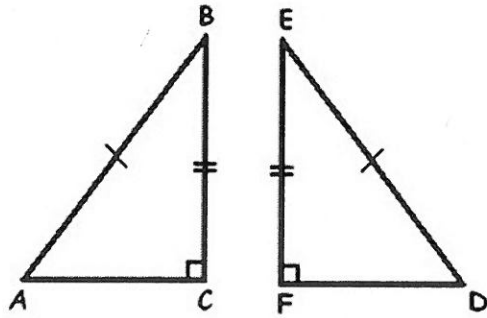


## 5.2 Practice Problems

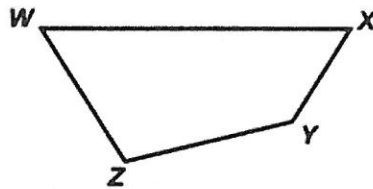
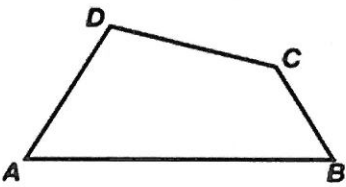
Triangles, Triangle Sum Theorem, Exterior Angle Theorem, Congruent Triangles

1. Identify all pairs of corresponding congruent angles and sides for each pair of congruent polygons. Then, write two different congruence statements for the polygons.



$\triangle ABC \cong \triangle DEF$   
 $\triangle BCA \cong \triangle EFD$   
 $\triangle CAB \cong \triangle FDE$   
 $\triangle ACB \cong \triangle DFE$   
 $\triangle CBA \cong \triangle FED$   
 $\triangle BAC \cong \triangle EDF$

$\angle B \cong \angle E$   
 $\angle A \cong \angle D$   
 $\angle C \cong \angle F$   
 $\overline{AB} \cong \overline{ED}$   
 $\overline{BC} \cong \overline{EF}$   
 $\overline{AC} \cong \overline{FD}$

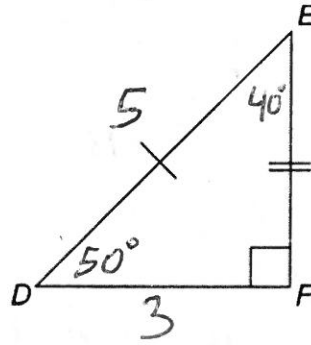
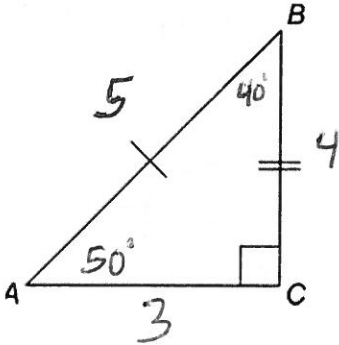


$\angle A \cong \angle W$   
 $\angle B \cong \angle X$   
 $\angle C \cong \angle Y$   
 $\angle D \cong \angle Z$   
 $\overline{AB} \cong \overline{WX}$   
 $\overline{BC} \cong \overline{XY}$   
 $\overline{CD} \cong \overline{YZ}$   
 $\overline{AD} \cong \overline{WZ}$

$ABCD \cong WXYZ$

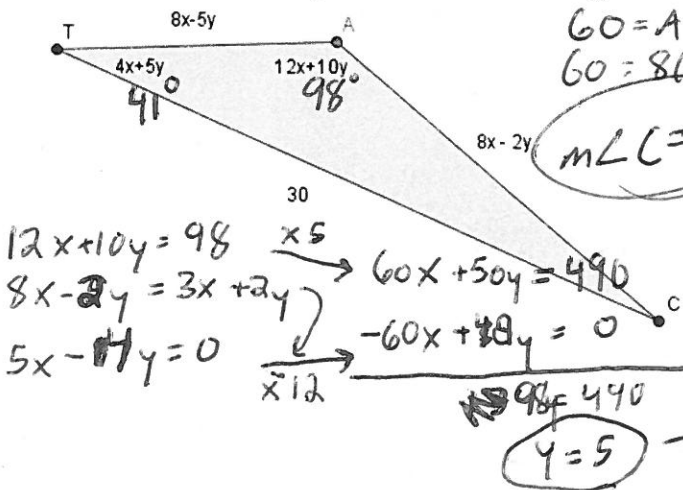
Two other examples  $\rightarrow$   $BCDA \cong XYZW$   
 $DCBA \cong ZYXW$

2. Given:  $AB = 5$ ,  $BC = 4$ ,  $m\angle E = 40^\circ$ , Find:  $DF$  and  $m\angle D$ .



$DF = 3$   
 $m\angle D = 50^\circ$

3. Given  $DOG \cong CAT$ , find the measure of angle C and segment GO.

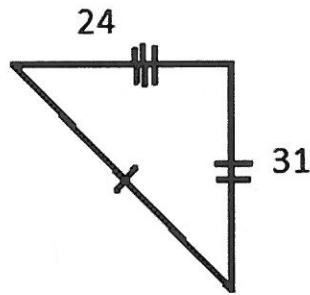
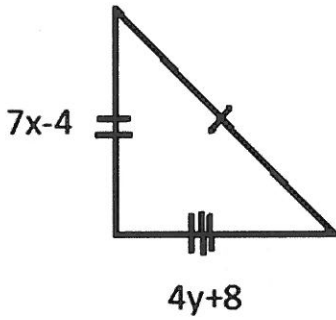


$GO = AT$   
 $GO = 8(4) - 5(5) = 7$   
 $m\angle C = 41^\circ$

I realize the problem doesn't make sense in the end b/c the triangle should be isosceles. Solve anyway.

$12x + 10y = 98$   
 $8x - 2y = 3x + 2y$   
 $5x - 4y = 0$   
 $\begin{matrix} 12x + 10y = 98 & \times 5 & \rightarrow & 60x + 50y = 490 \\ 5x - 4y = 0 & \times 12 & \rightarrow & -60x + 48y = 0 \\ \hline & & & 98y = 490 \\ & & & y = 5 \end{matrix}$   
 $5x - 4(5) = 0$   
 $5x = 20$   
 $x = 4$

4. Solve for x and y.



$$4y + 8 = 24$$

$$4y = 16$$

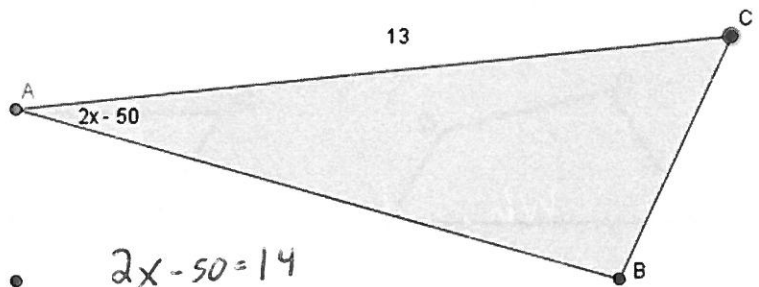
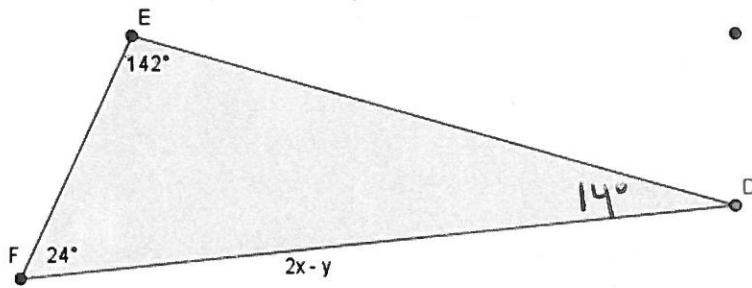
$$y = 4$$

$$7x - 4 = 31$$

$$7x = 35$$

$$x = 5$$

5. Find the measure of angle B.



$$2x - 50 = 14$$

$$2x = 64$$

$$x = 32$$

$$2x - y = 13$$

$$2(32) - y = 13$$

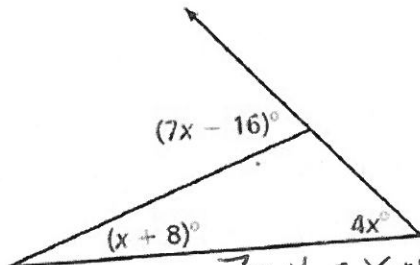
$$64 - 13 = y$$

$$y = 51$$

$$\text{Yes}$$

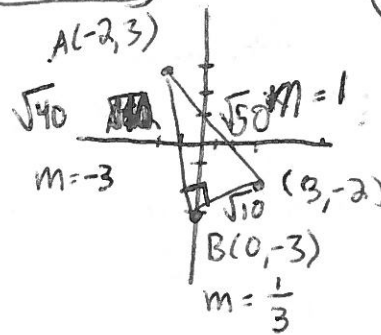
6. Classify  $\triangle ABC$  with vertices  $A(-2, 3)$ ,  $B(0, -3)$ , and  $C(3, -2)$  by its sides. Determine if it's a right triangle.

7. Find the measure of the exterior angle.



$$7x - 16 = x + 8 + 4x$$

$$2x = 24 \Rightarrow x = 12$$



8. Find the measures of the acute angles.

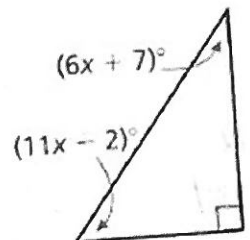
$$11x - 2 = 53$$

$$6x + 7 = 37$$

$$6x + 7 + 11x - 2 = 90$$

$$\frac{17x}{17} = \frac{85}{17}$$

$$x = 5$$



9. Find the measure of one acute angle of a right triangle if it is 3 times the sum of the measure of the other acute angle and 8.

Substitution

$$x = 3(y + 8) \quad \& \quad x + y = 90^\circ \rightarrow 90 - y = 3y + 24$$

$$66 = 4y \quad y = 16.5$$

10. Find the measure of one acute angle in a right triangle if it is twice the difference of the measure of the other acute angle and 12.

$$x = 2(y - 12) \rightarrow x = 2y - 24$$

$$x + y = 90 \rightarrow -x - y = -90$$

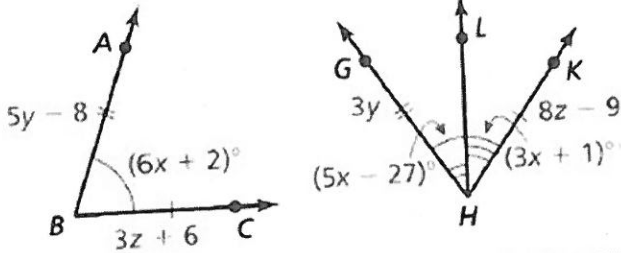
$$x - 2y = -24$$

$$-3y = -102$$

$$y = 34$$

16.5

11. Solve for x, y and z.



$$6x + 2 = 5x - 27 + 3x + 1$$

$$28 = 2x$$

$$14 = x$$

$$5y - 8 = 3y$$

$$2y = 8$$

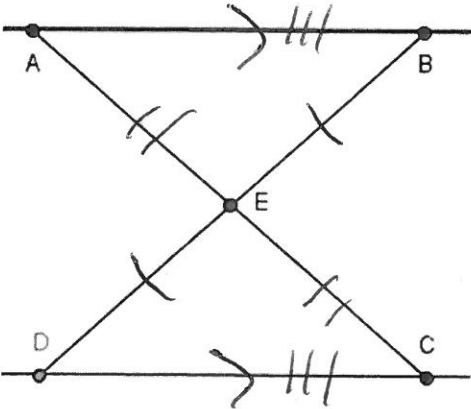
$$y = 4$$

$$3z + 6 = 8z - 9$$

$$15 = 5z$$

$$3 = z$$

12. Given  $\overline{AB} \parallel \overline{DC}$ , E is the midpoint of  $\overline{AC}$  and  $\overline{BD}$ ,  $\overline{AB} \cong \overline{DC}$ , Prove triangle  $ABE \cong CDE$ .



S	R
$AB \parallel DC$	Given
E is mdpt. of $\overline{AC}$ $\overline{BD}$	Given
$ED = EB$ $AE = EC$ $AB = DC$	Def of Midpoint
$\angle AEB \cong \angle DEC$ $\angle A \cong \angle C$   $\angle B \cong \angle D$	Given
	Vertical Angles Thm
	Alt. Interior Angles Thm.

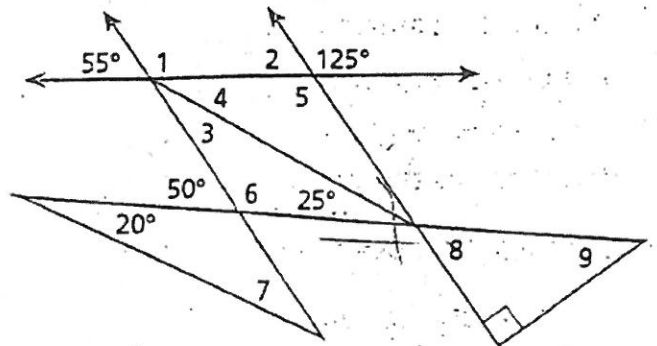
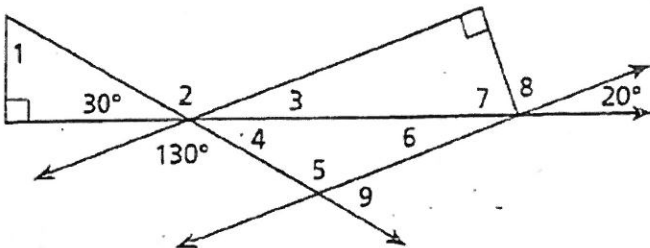
13. Given  $LMN \cong PQR$ ,  $m\angle L = 40$ ,  $m\angle M = 90$ ,  $m\angle P = 17x - y$ ,  $m\angle R = 2x + 4y$ , solve for x and y.

ON BACK

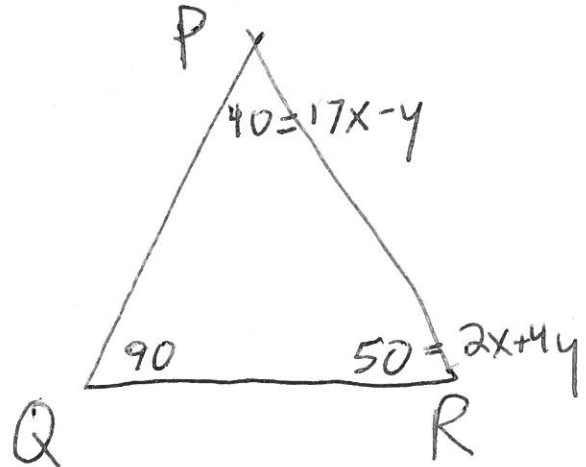
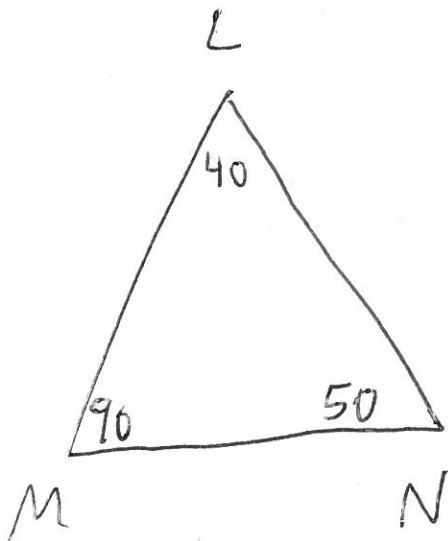
14. Given  $STU \cong XYZ$ ,  $m\angle T = 28$ ,  $m\angle U = 4x + y$ ,  $m\angle X = 130$ ,  $m\angle Y = 8x - 6y$ , solve for x and y.

ON BACK

15. Find the missing numbered angle measures.



13



$$\begin{aligned} 2x + 4y &= 50 \\ 4(17x - y) &= 40 \\ 68x - 4y &= 160 \end{aligned}$$

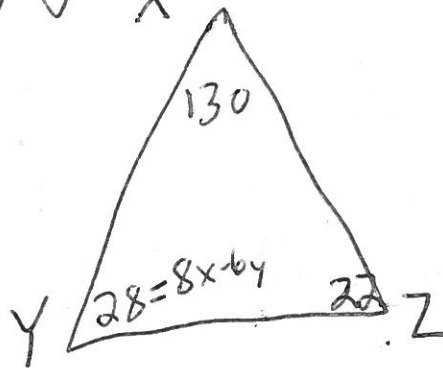
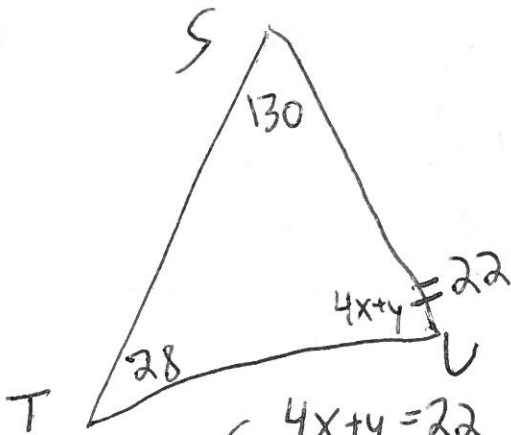
$$\begin{aligned} 70x &= 210 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 2(3) + 4y &= 50 \\ -6 & \quad -6 \\ 4y &= 44 \end{aligned}$$

$$y = 11$$

(3, 11)

14



$$\begin{aligned} 4x + y &= 22 \\ 8x - 6y &= 28 \\ \times 6 & \rightarrow 24x + 6y = 132 \end{aligned}$$

$$\begin{array}{r} 32x = 160 \\ \underline{32} \quad \underline{32} \\ x = 5 \end{array}$$

$$x = 5$$

$$4(5) + y = 22$$

$$y = 2$$

(5, 2)