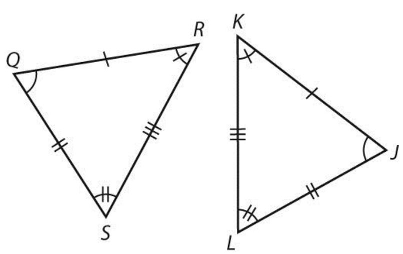
Name ________________________ Date ______________ Class ______________

MODULE 20 Triangle Congruence Criteria

LESSON 20-1

Practice and Problem Solving: A/B

1. $\angle Q$
2. $\overline{PQ}$
3. $\angle Y$
4. $\angle N$
5. $\overline{XZ}$
6. $\overline{YX}$
7. 12
8. 18
9. 60°
10. 24
11. 60°
12. 24
13. 

LESSON 20-2

Practice and Problem Solving: A/B

1. $\angle PQS \cong \angle RQS$; if these angles are congruent, then the triangles will be congruent by the ASA Congruence Theorem.
2. There is not enough information. Angle *VXW* is congruent to $\angle ZXY$ because they are vertical angles. $XV \cong XZ$ because *X* is the midpoint of *VZ.* If $\angle XVW \cong \angle XZY$, then the triangles are congruent by ASA.
3. No, side *HJ* does not correspond to side *DE* (and is not the included side of angles *G* and *H*), so the ASA Theorem does not apply.
4.

Statements	Reasons
1. $\angle ACD \cong \angle CAB$	1. Given
2. $\angle BCA \cong \angle DAC$	2. Given
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Property of Congruence
4. $\Delta ABC \cong \Delta CDA$	4. ASA Triangle Congruence Theorem

5. Possible answer: Rotate ΔABC 180° around point *A*, and then translate ΔABC to the left.

LESSON 20-3

Practice and Problem Solving: A/B

1. Yes. The right angle of a right triangle is the included angle of the two legs. If both pairs of legs are congruent, the triangles are congruent by SAS.
2. No. If all three angle pairs are congruent the triangles will be similar but not necessarily congruent. If two pairs of sides are congruent and two non-included or non-corresponding angles are congruent, the triangles are not necessarily congruent.
3. Possible answer: Two sides and the included angle of ΔABD ($\overline{AD}$, $\angle ADB$, $\overline{DB}$) are congruent respectively to two sides and the included angle of ΔCDB ($\overline{BC}$, $\angle CBD$, $\overline{DB}$), so the triangles are congruent by the SAS Triangle Theorem.
4. Possible answer: Rotate ΔABD 180° around point *B.* Then translate ΔABD down and left to map onto ΔCDB
5.

Statements	Reasons
1. *C* is the midpoint of $\overline{AD}$ and $\overline{BE}$.	1. Given
2. $AC = CD$, $BC = CE$	2. Definition of midpoint
3. $\overline{AC} \cong \overline{CD}$, $\overline{BC} \cong \overline{CE}$	3. Definition of congruent segments
4. $\angle ACB \cong \angle DCE$	4. Vertical Angles Theorem
5. ΔABC ≅ ΔDEC	5. SAS Triangle Theorem

LESSON 20-4

Practice and Problem Solving: A/B

1. $BD = FH = 6$, so $\overline{BD} \cong \overline{FH}$ by definition of ≅ segments. $BC = FG = 8$, so $\overline{BC} \cong \overline{FG}$ by definition of ≅ segments. $CD = GH = 9$, so $\overline{CD} \cong \overline{GH}$ by definition of ≅ segments. Therefore, $\Delta BCD \cong \Delta FGH$ by SSS.
2. Possible answer: Since $AB \cong AD$, $3x - 11 = x + 7$. Solving for x, $x = 9$. Substituting the value of x into the expressions gives $AB = AD = 16$ and $CB = CD = 13$. Finally, $CA = CA$. So, the triangles are congruent by the SSS Congruence Theorem, and $\angle B \cong \angle D$ by CPCTC.
3. Possible answer: No. There are only two pairs of congruent sides between the two triangles ($\overline{HG} \cong \overline{HJ}$; $\overline{HK} \cong \overline{HK}$), so the triangles are not necessarily congruent. Therefore it cannot be determined whether $\overline{GK} \cong \overline{JK}$, which would have to be true if $\overline{HK}$ is the perpendicular bisector of $\overline{GJ}$.

4.

Statements	Reasons
1. $\overline{XY} \cong \overline{ZY}$	1. Given
2. $\overline{XO} \cong \overline{ZO}$	2. Radii of a circle are congruent.
3. $\overline{YO} \cong \overline{YO}$	3. Reflexive property of congruence
4. $\triangle XYO \cong \triangle ZYO$	4. SSS Triangle Theorem
5. $\angle X \cong \angle Z$	5. CPCTC