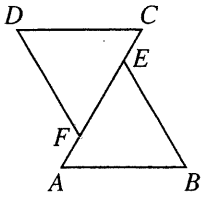
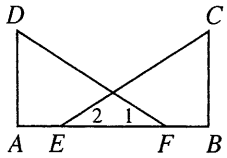
Geometry R
WS 4.9 Overlapping Triangles

Name_____
Date_____Period____

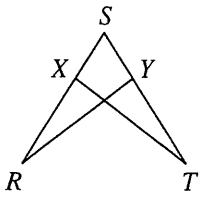
EXERCISES



Ex. 1

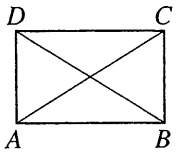


Ex. 2

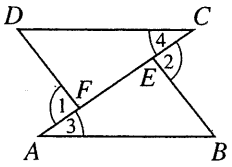


Ex. 3

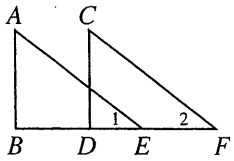
1. *Given:* $\overline{AFEC}$, $\overline{DC} \cong \overline{BA}$, $\overline{DF} \cong \overline{BE}$, $\overline{CE} \cong \overline{AF}$.
   Prove: $\triangle AEB \cong \triangle CFD$.
2. *Given:* $\overline{AEFB}$, $\overline{CE} \cong \overline{DF}$, $\angle 1 \cong \angle 2$, $\overline{AE} \cong \overline{BF}$.
   Prove: $\triangle AFD \cong \triangle BEC$.
3. *Given:* $\overline{SXR}$, $\overline{SYT}$, $\overline{SX} \cong \overline{SY}$, $\overline{XR} \cong \overline{YT}$.
   Prove: $\triangle RSY \cong \triangle TSX$.



Ex. 4

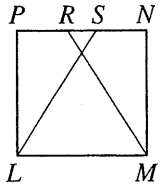


Ex. 5

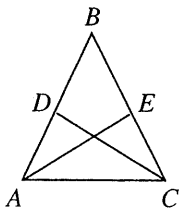


Ex. 6

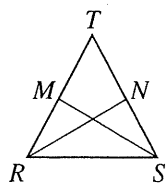
4. *Given:* $\overline{DA} \cong \overline{CB}$, $\overline{DA} \perp \overline{AB}$, $\overline{CB} \perp \overline{AB}$.
   Prove: $\triangle DAB \cong \triangle CBA$.
5. *Given:* $\overline{AFEC}$, $\overline{AF} \cong \overline{EC}$, $\angle 3 \cong \angle 4$, $\angle 1 \cong \angle 2$.
   Prove: $\triangle ABE \cong \triangle CDF$.
6. *Given:* $\overline{AB} \perp \overline{BF}$, $\overline{CD} \perp \overline{BF}$, $\overline{BD} \cong \overline{FE}$, $\angle 1 \cong \angle 2$.
   Prove: $\triangle ABE \cong \triangle CDF$.



Ex. 7

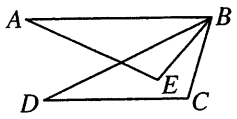


Ex. 8

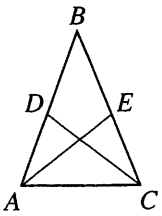


Ex. 9

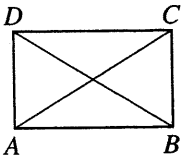
7. *Given:* $\overline{LP} \perp \overline{PN}$, $\overline{MN} \perp \overline{PN}$, $\overline{LP} \cong \overline{MN}$, $\overline{PR} \cong \overline{NS}$, $\overline{PRSN}$.
   Prove: $\triangle LPS \cong \triangle MNR$.
8. *Given:* $\angle BAC \cong \angle BCA$, $\overline{CD}$ bisects $\angle BCA$, $\overline{AE}$ bisects $\angle BAC$.
   Prove: $\triangle ADC \cong \triangle CEA$.
9. *Given:* $\overline{TR} \cong \overline{TS}$, $\overline{MR} \cong \overline{NS}$.
   Prove: $\triangle RTN \cong \triangle STM$.



Ex. 10



Ex. 11

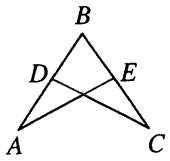


Ex. 12

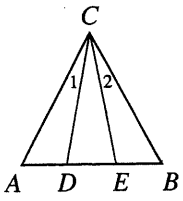
10. *Given:* $\overline{AB} \cong \overline{DB}$, $\angle A \cong \angle D$, $\angle DBA \cong \angle CBE$.
Prove: $\triangle ABE \cong \triangle DBC$.

11. *Given:* $\overline{DA} \cong \overline{EC}$, $\overline{DC} \cong \overline{EA}$.
Prove: **a.** $\triangle CAD \cong \triangle ACE$. **b.** $\angle DCA \cong \angle EAC$.

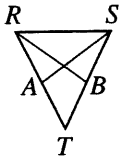
12. *Given:* $\overline{DA} \perp \overline{AB}$, $\overline{CB} \perp \overline{AB}$, $\overline{AD} \cong \overline{BC}$.
Prove: **a.** $\triangle DAB \cong \triangle CBA$. **b.** $\overline{AC} \cong \overline{BD}$.



Ex. 13



Ex. 14

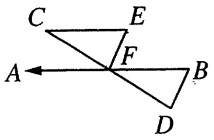


Ex. 15

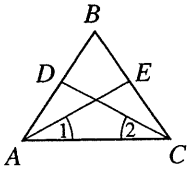
13. *Given:* $\overline{ADB}$, $\overline{BEC}$, $\overline{BD} \cong \overline{BE}$, $\overline{DA} \cong \overline{EC}$.
Prove: **a.** $\triangle DBC \cong \triangle EBA$. **b.** $\angle A \cong \angle C$.

14. *Given:* $\overline{ADEB}$, $\overline{AC} \cong \overline{BC}$, $\overline{CE} \cong \overline{CD}$, $\overline{AE} \cong \overline{BD}$.
Prove: **a.** $\triangle ACE \cong \triangle BCD$. **b.** $\angle 1 \cong \angle 2$.

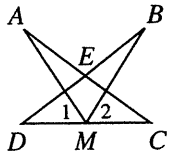
15. If $\overline{RT} \cong \overline{ST}$ and median $\overline{RB} \cong$ median $\overline{SA}$, prove that $\angle RAS \cong \angle SBR$.



Ex. 16



Ex. 17



Ex. 18

16. Given $\overrightarrow{BFA}$, $\overline{CFD}$, $\angle ECF \cong \angle CFA$, $\overline{CF} \cong \overline{FD}$, and $\overline{CE} \cong \overline{FB}$, prove that $\overline{EF} \cong \overline{BD}$.

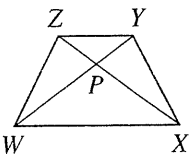
17. Given $\overline{ADB}$, $\overline{BEC}$, $\overline{BD} \cong \overline{BE}$, and $\overline{DA} \cong \overline{EC}$, prove that $\angle 1 \cong \angle 2$.

18. If $\overline{AC}$ and $\overline{BD}$ intersect at E, $\angle D \cong \angle C$, M is the midpoint of $\overline{DC}$, and $\angle 1 \cong \angle 2$, prove that $\overline{DB} \cong \overline{CA}$.

In 20–23, select the *numeral* preceding the choice that best completes the statement.

20. It can be proved that $\angle YWX \cong \angle ZXW$ if it is known that
(1) $\overline{ZW} \cong \overline{YX}$ (2) $\overline{YW} \cong \overline{YX}$
(3) $\overline{PW} \cong \overline{PX}$ (4) $\overline{PW} \cong \overline{YX}$

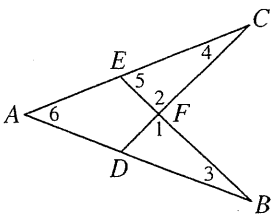
21. If $\triangle ZPW \cong \triangle YPX$, it can be proved that
(1) $\triangle ZPW$ is isosceles (2) $\triangle YPX$ is isosceles
(3) $\triangle PWX$ is isosceles (4) $\triangle YWX$ is isosceles



Ex. 20–21

22. If $\overline{AB} \cong \overline{AC}$, it can be proved that $\overline{CD} \cong \overline{BE}$ if it is also known that
(1) $\angle 1 \cong \angle 2$ (2) $\angle 3 \cong \angle 4$
(3) $\angle 3 \cong \angle 5$ (4) $\angle 4 \cong \angle 6$

23. If $\angle 3 \cong \angle 4$, it can be proved that $\overline{EC} \cong \overline{DB}$ if it is also know that
(1) $\overline{CF} \cong \overline{BF}$ (2) $\overline{CD} \cong \overline{BE}$
(3) $\overline{CA} \cong \overline{BA}$ (4) $\overline{EA} \cong \overline{DA}$



Ex. 22–23