17. Given: $ABCDE$, where $\angle EAB \cong \angle ABC \cong \angle BCD \cong \angle CDE \cong \angle DEA$ and $\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{DE} \cong \overline{EA}$.

Prove: $\triangle ACE$ is an isosceles triangle

Statement	Reason
1) $\overline{AB} \cong \overline{ED}, \overline{BC} \cong \overline{DC}$, $\angle ABC \cong \angle EDC$	**1)** Given.
2) $\triangle ABC \cong \triangle EDC$	**2)** Side-Angle-Side (SAS)
3) $\overline{AC} \cong \overline{EC}$	**3)** Corresponding Parts of Congruent Triangles are Congruent (CPCTC).
4) $\triangle ACE$ is an isosceles triangle.	**4)** Definition of isosceles

18. $m\angle RTS = f$. Given $\overline{DE} \cong \overline{SR}$, $\overline{DF} \cong \overline{RT}$ and $\angle EDF \cong \angle SRT$. According to SAS, $\triangle DEF \cong \triangle RST$. By CPCTC, if two triangles are congruent, then each pair of corresponding angles is congruent. Therefore, $\angle DFE \cong \angle RTS$ by CPCTC. Since we are given $m\angle DEF = f$ and $\angle DEF \cong \angle RTS$ by CPCTC, $m\angle RTS = f$.

19. According to SSS, if all side lengths of one triangle are congruent to all side lengths of another triangle, then the triangles are congruent. All three sides must be known to use SSS, so the lengths of RP and UT are needed.

20. To show congruency by SSS, you also need to know $\overline{AB} \cong \overline{DE}$ and $\overline{AC} \cong \overline{DF}$.

21. Yes. Given $\overline{RS} \cong \overline{TU}$, $\overline{RV} \cong \overline{VU}$, and $\angle TSV \cong \angle STV$. $\triangle STV$ is isosceles by the definition of isosceles triangles. $\overline{SV} \cong \overline{TV}$ by the Converse of the Isosceles Triangle Theorem. So $\triangle RSV \cong \triangle UTV$ by SSS.

22. Yes; $\overline{PQ} \cong \overline{PS}$, $\overline{PR} \cong \overline{PR}$, and $\angle QPR \cong \angle SPR$, so $\triangle PQR \cong \triangle PRS$ by SAS.

23. No; the players run the same distance. Given that the field is a rectangle, the opposite sides that measure 10 meters are congruent. By the Reflexive Property of Congruence, the south side of the field is congruent to itself and the southwest and southeast corners are congruent because they are right angles. So, by SAS, the triangles composed of two adjacent sides of the field and the connecting diagonal are congruent triangles and the diagonals run by the girls are congruent by CPCTC.