

Geometry

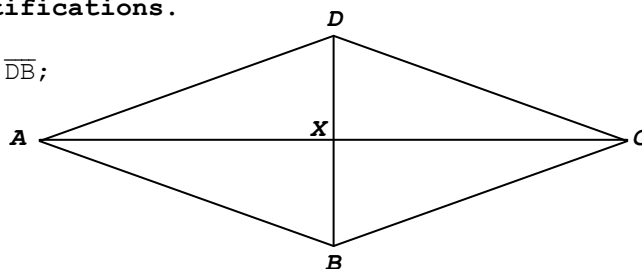
Date: _____
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Start Time: _____
 Congruent and Isosceles Triangles

End Time: _____
 Score: ____/38

1-18. Fill in the missing statements and justifications.

Given: $\triangle ABD$ and $\triangle BCD$ are isosceles with base \overline{DB} ;
 \overline{AC} bisects Angles A and C, $\triangle BAC$ is isosceles
 with base \overline{AC}



Prove: $\triangle ABX \cong \triangle ADX \cong \triangle CBX \cong \triangle CDX$

Proof: Statements

Justifications

1. $AD = BA$	1.
2. \overline{AC} bisects \overline{DB}	2.
3.	3. Def. of Bisector
4.	4. Reflexive Prop.
5. $\triangle ABX \cong \triangle ADX$	5.
6. $DC = BC$	6.
7. $\angle DCX \cong \angle BCX$	7.
8.	9.
10.	10. SAS Congruence Thm.
11. $BX = BX$	11.
12.	13.
14. $m \angle DXC = 90^\circ$	14.
$m \angle BXC = 90^\circ$	Supplementary Angles
15. $m \angle BXA = 90^\circ$	15.
16.	16. HL Congruence Thm.
17.	17. Transitive Prop.

18-22. True or false?

18. An isosceles triangle does not have to have any congruent angles.

19. In an isosceles triangle, $m \angle \text{Vertex} = 180^\circ - 2(m \angle \text{Base})$

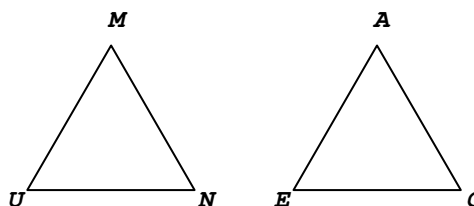
Geometry

20. In an isosceles triangles, $m \angle \text{Base} = \frac{1}{2}(180^\circ - m \angle \text{Vertex})$
21. A triangle with three congruent angles is isosceles.
22. All equilateral triangles are also isosceles.
23. All isosceles triangles are also equilateral.
24. Isosceles triangles are congruent if their bases are congruent, and one pair of their legs are congruent.
25. Isosceles triangles are congruent if their bases are congruent.

26-37. Are the triangles necessarily congruent under the given conditions? If so, which theorem applies?

26. $MU = UN = AE = EC$; $m \angle U = m \angle E$

27. $\triangle MUN$ and $\triangle ACE$ are isosceles with, respectively, bases \overline{MU} and \overline{AE} .



28. $CA = MN$; both triangles are isosceles
29. $\triangle MUN$ and $\triangle ACE$ are isosceles with congruent vertex angles.
30. $\triangle MUN$ and $\triangle ACE$ are isosceles with congruent vertex angles and congruent bases.
31. $\triangle MUN$ and $\triangle ACE$ are isosceles with congruent vertex angles and congruent legs.
32. $MU = AE$; $UN = AC$; $EC \neq MN$
33. $MU = AC$; $MN = AC$; $m \angle A = m \angle M$; $MU \neq EC$
34. $UN = EC$; $AC = UM$; $MN = AE$
35. All sides are congruent.
36. $MN = AC$; $CE = UN$; $m \angle U = m \angle E$
37. $MN = AC$; $CE = UN$; $m \angle U = m \angle E = 90^\circ$
38. True or false? If $MU = MN = AE = AC$; $m \angle U = m \angle E$, then the triangles are congruent.