1. 77, 103, 103

2. 69, 69, 111

3. 49, 131, 131

4. 105, 75, 75

5. 115, 115, 65

6. 120, 120, 60

7. **a.** isosc. trapezoids

b. 69, 69, 111, 111

8. 90, 68

9. 90, 45, 45

10. 108, 108

11. 90, 26, 90

12. 90, 40, 90

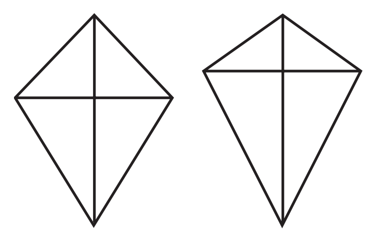
13. 90, 55, 90, 55, 35

14. 90, 52, 38, 37, 53

15. 90, 90, 90, 90, 46, 34, 56, 44, 56, 44

16. 112, 112

17. Answers may vary. Sample:



18. 12, 12, 21, 21

19. Explanations may vary. Sample: If both ∠s are bisected, then this combined with $\overline{KM} \cong \overline{KM}$ by the Reflexive Prop. means $\triangle KLM \cong \triangle KNM$ by SAS. By CPCTC, $\angle L \cong \angle N$. $\angle L$ and $\angle N$ are opp. ∠s, but if *KLMN* is isos., both pairs of base ∠s are also ≅. By the Trans. Prop., all 4 angles are ≅, so *KLMN* must be a rect. or a square. This contradicts what is given, so $\overline{KM}$ cannot bisect $\angle LMN$ and $\angle LKN$.

20. 12

21. 15

22. 15

23. 3

24. 4

25. 1

26. 28

27. $x = 35, y = 30$

28. $x = 18, y = 108$

29. Isosc. trapezoid; all the large rt. $\triangle$s appear to be $\cong$.

30. 112, 68, 68

31. Yes, the $\cong$ $\angle$s can be obtuse.

32. Yes, the $\cong$ $\angle$s can be obtuse, as well as one other $\angle$.

33. Yes; if 2 $\cong$ $\angle$s are rt. $\angle$s, they are suppl. The other 2 $\angle$s are also suppl.

34. No; if two consecutive $\angle$s are suppl., then another pair must be also because one pair of opp. $\angle$s is $\cong$. Therefore, the opp. $\angle$s would be $\cong$, which means the figure would be a ▱ and not a kite.

35. Yes; the $\cong$ $\angle$s may be 45° each.

36. No; if two consecutive $\angle$s were compl., then the kite would be concave.

37. Rhombuses and squares would be kites since opp. sides can be $\cong$ also.

38. **1.** $ABCD$ is an isos. trapezoid, $\overline{AB} \cong \overline{DC}$. (Given)

2. Draw $\overline{AE} \parallel \overline{DC}$. (Two points determine a line.)

3. $\overline{AD} \parallel \overline{EC}$ (Def. of a trapezoid)

4. $AECD$ is a ▱. (Def. of a ▱)

5. $\angle C \cong \angle 1$ (Corr. ∠s are ≅.)

6. $\overline{DC} \cong \overline{AE}$ (Opp. sides of a ▱ are ≅.)

7. $\overline{AB} \cong \overline{AE}$ (Trans. Prop. of ≅)

8. $\triangle AEB$ is an isosc. △. (Def. of an isosc. △)

9. $\angle B \cong \angle 1$ (Base ∠s of an isosc. △ are ≅.)

10. $\angle B \cong \angle C$ (Trans. Prop. of ≅)

11. $\angle B$ and $\angle BAD$ are suppl., $\angle C$ and $\angle CDA$ are suppl. (Same side int. ∠s are suppl.)

12. $\angle BAD \cong \angle CDA$ (Suppl. of ≅ ∠s are ≅.)

39. Answers may vary. Sample: Draw $\overline{TA}$ and $\overline{RP}$.

1. isosc. trapezoid $TRAP$ (Given)

2. $\overline{TA} \cong \overline{PR}$ (Diag. of an isosc. trap. are ≅.)

3. $\overline{TR} \cong \overline{PA}$ (Given)

4. $\overline{RA} \cong \overline{RA}$ (Refl. Prop. of ≅)

5. $\triangle TRA \cong \triangle PAR$ (SSS)

6. $\angle RTA \cong \angle APR$ (CPCTC)

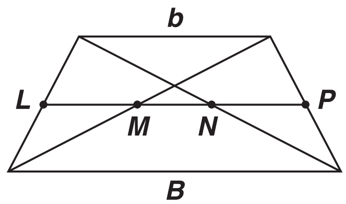
40. Draw $\overline{BI}$ as described, then draw $\overline{BT}$ and $\overline{BP}$.

1. $\overline{TR} \cong \overline{PA}$ (Given)
2. $\angle R \cong \angle A$ (Base $\angle$s of isosc. trap. are $\cong$.)
3. $\overline{RB} \cong \overline{AB}$ (Def. of bisector)
4. $\triangle TRB \cong \triangle PAB$ (SAS)
5. $\overline{BT} \cong \overline{BP}$ (CPCTC)
6. $\angle RBT \cong \angle ABP$ (CPCTC)
7. $\angle TBI \cong \triangle PBI$ (Compl. of $\cong$ $\angle$s are $\cong$.)
8. $\overline{BI} \cong \overline{BI}$ (Refl. Prop. of $\cong$)
9. $\triangle TBI \cong \triangle PBI$ (SAS)
10. $\angle BIT \cong \angle BIP$ (CPCTC)
11. $\angle BIT$ and $\angle BIP$ are rt. $\angle$s. ($\cong$ suppl. $\angle$s are rt. $\angle$s.)
12. $\overline{TI} \cong \overline{PI}$ (CPCTC)
13. $\overline{BI}$ is $\perp$ bis. of $\overline{TP}$. (Def. of $\perp$ bis.)

41–42. Check students' justifications. Samples are given.

41. It is one half the sum of the lengths of the bases; draw a diag. of the trap. to form 2 $\triangle$s. The bases B and b of the trap. are each a base of a $\triangle$. Then the segment joining the midpts. of the non-$\|$ sides is the sum of the midsegments of the $\triangle$s. This sum is $\frac{1}{2}B + \frac{1}{2}b = \frac{1}{2}(B + b)$.

42. It is one half the difference of the lengths of the bases. By the $\triangle$ Midsegment Thm. and the $\parallel$ Post., midpoints L, M, N, and P are collinear. $MN = LN - LM = \frac{1}{2}B - \frac{1}{2}b$ ($\triangle$ Midsegment Thm.) $= \frac{1}{2}(B - b)$.



43. D is any point on $\overleftrightarrow{BN}$ such that $ND \neq BN$ and D is below N.

44. **1.** $\overline{AB} \cong \overline{CB}, \overline{AD} \cong \overline{CD}$ (Given)

2. $\overline{BD} \cong \overline{BD}$ (Refl. Prop. of $\cong$)

3. $\triangle ABD \cong \triangle CBD$ (SSS)

4. $\angle A \cong \angle C$ (CPCTC)