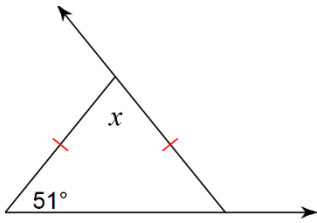


Section 8.2 Isosceles Triangle Proofs Worksheet

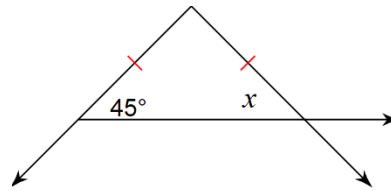
Name: _____ Hr: _____

Find the value of x .

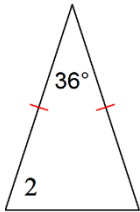
1. 78°



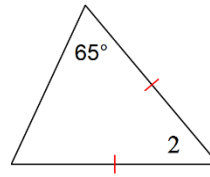
2. 45°



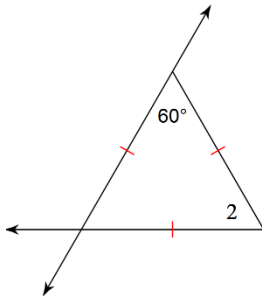
3. $x = 6$ $m\angle 2 = 11x + 6$



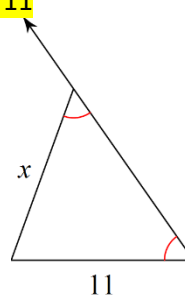
4. $x = -8$ $m\angle 2 = x + 58$



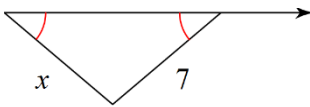
5. $x = -11$ $m\angle 2 = x + 71$



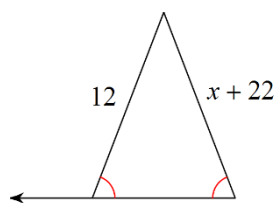
6. $x = 11$



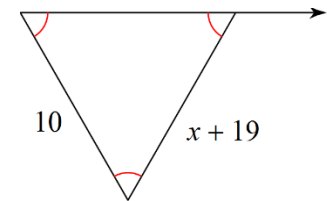
7. $x = 7$



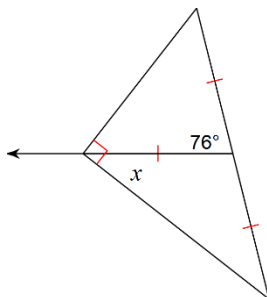
8. $x = -10$



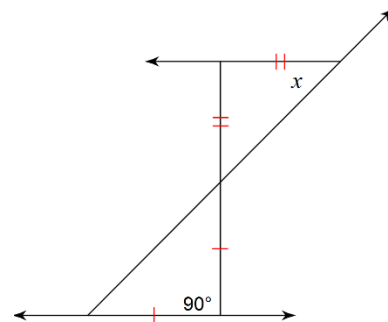
9. $x = -9$



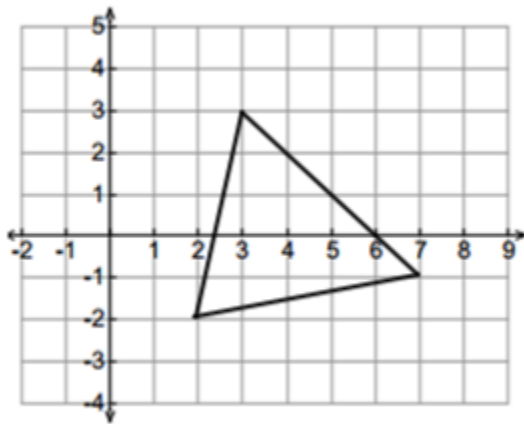
10. 38°



11. 45°



12. Given: $\triangle ABC$ has vertices A (7, -1), B (2, -2) and C (3, 3)
 Prove: $\triangle ABC$ is an isosceles triangle



$$\overline{AB} = \sqrt{(7-2)^2 + (-1-(-2))^2}$$

$$= \sqrt{25+1}$$

$$= \sqrt{26}$$

$$\overline{BC} = \sqrt{(2-3)^2 + (-2-3)^2}$$

$$= \sqrt{1+25}$$

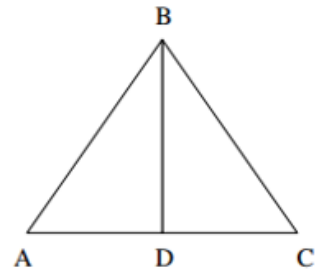
$$= \sqrt{26}$$

$$\overline{AC} = \sqrt{(7-3)^2 + (-1-3)^2}$$

$$= \sqrt{16+16}$$

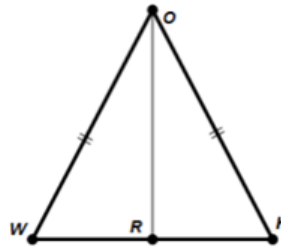
$$= \sqrt{32}$$

13. Given: $\triangle ABC$ is isosceles
 \overline{BD} bisects $\angle ABC$
 Prove: $\triangle ABD \cong \triangle CBD$



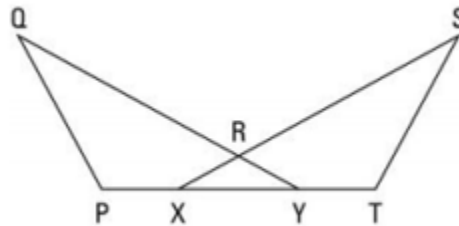
| Statement | Reason |
|---|--|
| 1. $\triangle ABC$ is isosceles | 1. Given |
| 2. $\angle A \cong \angle C$ or $\overline{AB} \cong \overline{CB}$ | 2. Base angles in isosceles triangles are congruent/Definition of Isosceles Triangle |
| 3. \overline{BD} bisects $\angle ABC$ | 3. Given |
| 4. $\angle ABD \cong \angle CBD$ | 4. Definition of Angles Bisector |
| 5. $\overline{BD} \cong \overline{BD}$ | 5. Reflexive Property of Congruence |
| 6. $\triangle ABD \cong \triangle CBD$ | 6. AAS or SAS or ASA |

14. Given: $\triangle WOK$ is isosceles
 R is the midpoint of \overline{WK}
 Prove: $\angle OWR \cong \angle OKR$



| Statement | Reason |
|---|--|
| 1. $\triangle WOK$ is isosceles | 1. Given |
| 2. $\overline{WO} \cong \overline{KO}$ | 2. Definition of an isosceles Triangle |
| 3. R is the midpoint of \overline{WK} | 3. Given |
| 4. $\overline{WR} \cong \overline{KR}$ | 4. Definition of a Midpoint |
| 5. $\overline{OR} \cong \overline{OR}$ | 5. Reflexive Property of Congruence |
| 6. $\triangle WRO \cong \triangle KRO$ | 6. SSS |
| 7. $\angle OWR \cong \angle OKR$ | 7. CPCTC |

15. Given: $\triangle XRY$ is isosceles
 $\overline{PQ} \cong \overline{TS}$
 $\angle Q \cong \angle S$
 Prove: $\overline{QY} \cong \overline{SX}$



| Statement | Reason |
|--|---|
| 1. $\triangle XRY$ is isosceles | 1. Given |
| 2. $\angle x \cong \angle y$ | 2. Base angles in isosceles triangles are congruent |
| 3. $\overline{PQ} \cong \overline{TS}$ | 3. Given |
| 4. $\angle Q \cong \angle S$ | 4. Given |
| 5. $\triangle YQP \cong \triangle XST$ | 5. AAS |
| 6. $\overline{QY} \cong \overline{SX}$ | 6. CPCTC |