

Triangle Congruence

Review 4.1 / Triangles and Congruence

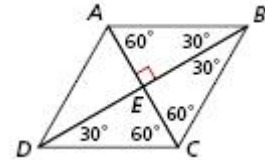
4.1.1 Classifying Triangles

Classify each triangle by its angle measures.

1. $\triangle BEA$

2. $\triangle DBC$

3. $\triangle ABC$

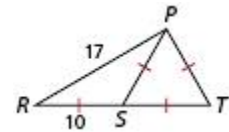


Classify each triangle by its side lengths.

4. $\triangle PST$

5. $\triangle RSP$

6. $\triangle RPT$

**Multi-Step** Find the side lengths of each triangle.

7.

8.

9. Draw a triangle large enough to measure. Label the vertices X, Y, and Z.
- Name the three sides and three angles of the triangle.

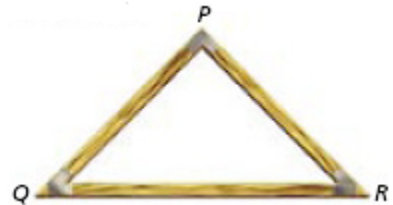
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- b. Use a ruler and protractor to classify the triangle by its side lengths and angle measures.

Carpentry Use the following information for Exercises 10 and 11.

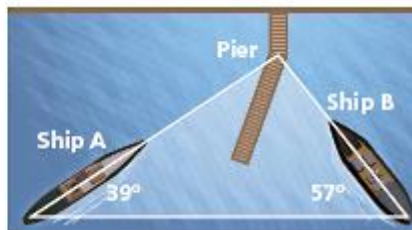
A manufacturer makes trusses, or triangular supports, for the roofs of houses. Each truss is the shape of an isosceles triangle in which $\overline{PQ} \cong \overline{PR}$. The length of the base \overline{QR} is $\frac{4}{3}$ the length of each of the congruent sides.



10. The perimeter of each truss is 60 ft. Find each side length.
11. How many trusses can the manufacturer make from 150 feet of lumber?

4.1.2 Angle Relationships in Triangles

12. **Navigation** A sailor on ship A measures the angle between ship B and the pier and finds that it is 39° . A sailor on ship B measures the angle between ship A and the pier and finds that it is 57° . What is the measure of the angle between ships A and B?



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The measure of one of the acute angles in a right triangle is given.
What is the measure of the other acute angle?

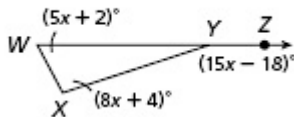
13. $76\frac{1}{4}^\circ$

14. $2x^\circ$

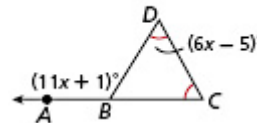
15. 56.8°

Find each angle measure.

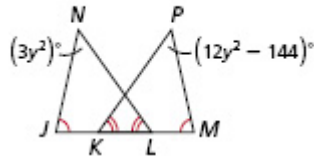
16. $m\angle XYZ$



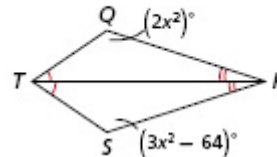
17. $m\angle C$



18. $m\angle N$ and $m\angle P$



19. $m\angle Q$ and $m\angle S$



4.1.3 Congruent Triangles

Given: Polygon $CDEF \cong$ polygon $KLMN$. Identify the congruent corresponding parts.

20. $\overline{DE} \cong$?

21. $\overline{KN} \cong$?

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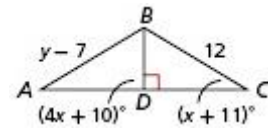
22. $\angle F \cong \underline{\quad ? \quad}$

23. $\angle L \cong \underline{\quad ? \quad}$

Given: $\triangle ABD \cong \triangle CBD$. Find each value.

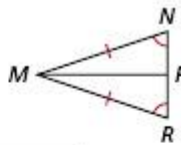
24. $m\angle C$

25. y



26. Given: \overline{MP} bisects $\angle NMR$. P is the midpoint of \overline{NR} . $\overline{MN} \cong \overline{MR}$, $\angle N \cong \angle R$
 Prove: $\triangle MNP \cong \triangle MRP$

Proof:



Statements	Reasons
1. $\angle N \cong \angle R$	1. a. $\underline{\quad ? \quad}$
2. \overline{MP} bisects $\angle NMR$.	2. b. $\underline{\quad ? \quad}$
3. c. $\underline{\quad ? \quad}$	3. Def. of \angle bisector
4. d. $\underline{\quad ? \quad}$	4. Third \triangle Thm.
5. P is the mdpt. of \overline{NR} .	5. e. $\underline{\quad ? \quad}$
6. f. $\underline{\quad ? \quad}$	6. Def. of mdpt.
7. $\overline{MN} \cong \overline{MR}$	7. g. $\underline{\quad ? \quad}$
8. $\overline{MP} \cong \overline{MP}$	8. h. $\underline{\quad ? \quad}$
9. $\triangle MNP \cong \triangle MRP$	9. Def. of $\cong \triangle$

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27. **Hobbies** In a garden, triangular flower beds are separated by straight rows of grass as shown.

Given: $\angle ADC$ and $\angle BCD$ are right angles.

$$\overline{AC} \cong \overline{BD}, \overline{AD} \cong \overline{BC}$$

$$\angle DAC \cong \angle CBD$$

Prove: $\triangle ADC \cong \triangle BCD$

