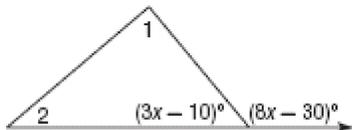


### Geometry Unit 4 Study Guide

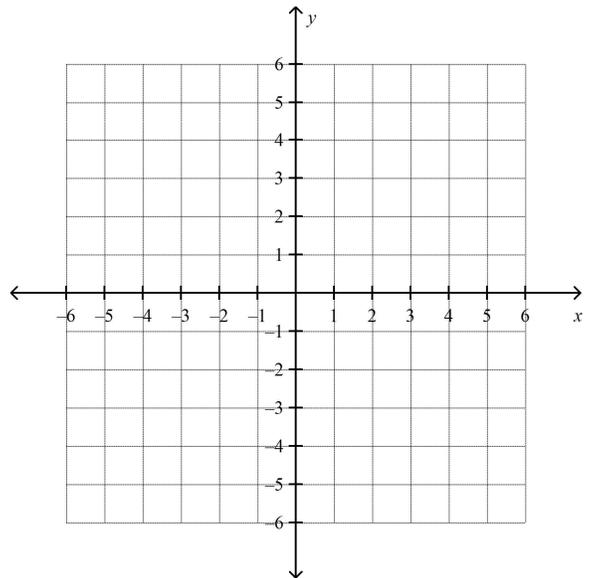
- If  $\triangle ABC$  is isosceles,  $\angle B$  is the vertex angle,  $AB = 20x - 2$ ,  $BC = 12x + 30$ , and  $AC = 25x$ , find  $x$  and the length of each side of the triangle.
- Find the length of the sides of the triangle with vertices  $A(0, 4)$ ,  $B(5, 4)$ , and  $C(-3, -2)$ . Classify the triangle by its sides and angles.

Use the figure below to answer the following questions.

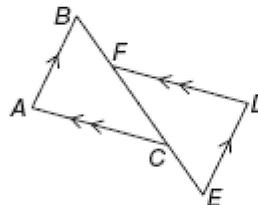


- Find the value of  $x$ .
- Find  $m\angle 1$ , if  $m\angle 1 = 4x + 10$ .
- Find  $m\angle 2$ .

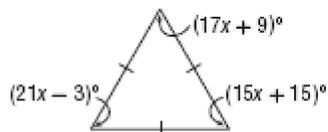
- Determine whether  $\triangle GHI \cong \triangle JKL$ , given  $G(1, 2)$ ,  $H(5, 4)$ ,  $I(3, 6)$  and  $J(-4, -5)$ ,  $K(0, -3)$ ,  $L(-2, -1)$ . Explain.



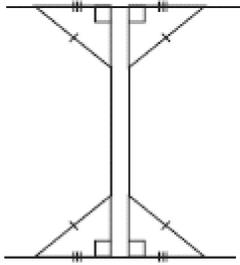
- In the figure,  $\overline{AC} \cong \overline{FD}$ ,  $\overline{AB} \parallel \overline{DE}$ , and  $\overline{AC} \parallel \overline{FD}$ . Determine which postulate can be used to prove  $\triangle ABC \cong \triangle DEF$ . Choose from SSS, SAS, ASA, and AAS.



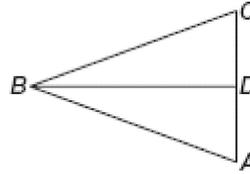
- Find  $x$ .



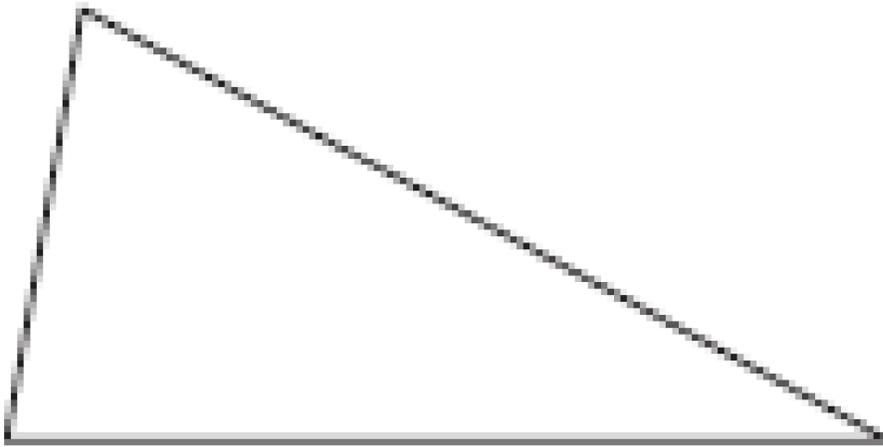
9. A wood column is supported by four cables that form four triangles. Determine which postulate can be used to show that all the triangles are congruent.



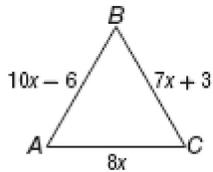
10.  $\triangle ABC$  is an isosceles triangle with  $\overline{BD} \perp \overline{AC}$ . Name the theorem that could be used to determine  $\angle A \cong \angle C$ . Then name the postulate that could be used to prove  $\triangle BDA \cong \triangle BDC$ . Choose from SSS, SAS, ASA, and AAS.



11. Use a protractor and ruler to classify the triangle by its angles and sides.

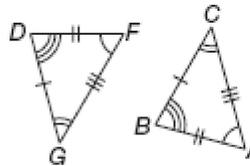


12. Find  $x$ ,  $AB$ ,  $BC$ , and  $AC$  if  $\triangle ABC$  is equilateral.

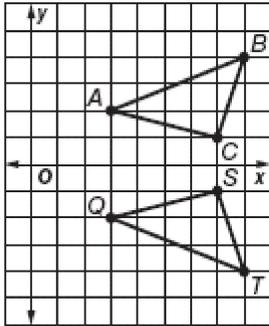


13. Find the measure of the sides of the triangle if the vertices of  $\triangle EFG$  are  $E(-3, 3)$ ,  $F(1, -1)$ , and  $G(-3, -5)$ . Then classify the triangle by its sides.

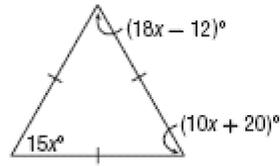
14. Identify the congruent triangles and name their corresponding congruent angles.



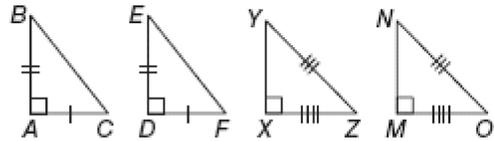
15. Identify the transformation and verify that it is a congruence transformation.



16. Find the value of  $x$ .



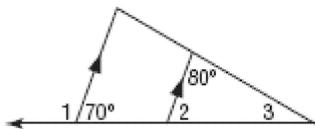
17. Without finding any other angles or sides congruent, determine which pair of triangles can be proved to be congruent by the HL Theorem.



18. Use a protractor and ruler to classify the triangle by its angles and sides.



Use the figure below to answer the following questions. Find the measure of each angle.



19.  $m\angle 1$

20.  $m\angle 2$

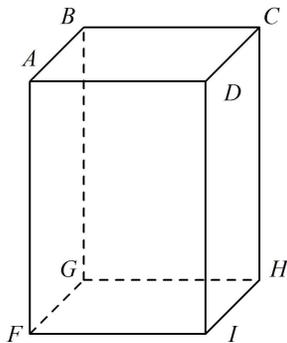
21.  $\sqrt{12a^4b^6}$

22. The measures of two complementary angles are  $6y + 3$  and  $4y - 13$ . Find the measures of the angles.
- 117, 63
  - 19
  - 63, 27
  - 10

Write the contrapositive of the conditional statement. Determine whether the contrapositive is true or false. If it is false, find a counterexample.

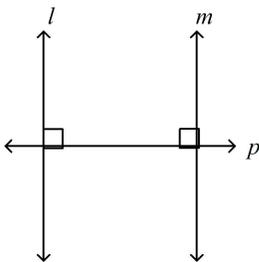
23. Two segments having the same measure are congruent.

Refer to the figure below.



24. Name all segments skew to  $\overline{GF}$ .
- $\overline{BC}, \overline{AD}, \overline{DI}, \overline{CH}$
  - $\overline{FI}, \overline{GH}, \overline{DI}, \overline{CH}$
  - $\overline{AD}, \overline{AB}, \overline{BC}, \overline{CD}$
  - $\overline{CD}, \overline{CH}, \overline{DI}, \overline{HI}$

25. The yardage lines on a football field are parallel. The grounds crew has painted two yardage lines given by  $l$  and  $m$  in the figure below. Explain how the grounds crew could ensure that the lines  $l$  and  $m$  are parallel.

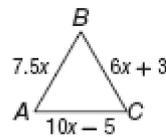


26. Which best describes the type of triangle?



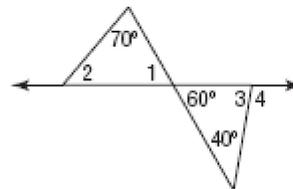
- acute
- equiangular
- obtuse
- right

27. What is the value of  $x$  if  $\triangle ABC$  is equilateral?



- 8
- $-\frac{1}{8}$
- $\frac{1}{2}$
- 2

Use the figure below to answer the following questions.

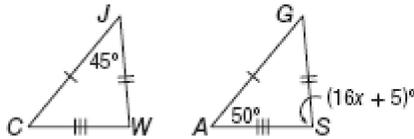


28. What is  $m\angle 2$ ?
- 50
  - 70
  - 110
  - 120

29. What is  $m\angle 4$ ?

- a. 10
- b. 60
- c. 100
- d. 120

30. If  $\triangle CJW \cong \triangle AGS$ ,  $m\angle A = 50$ ,  $m\angle J = 45$ , and  $m\angle S = 16x + 5$ , what is the value of  $x$ ?

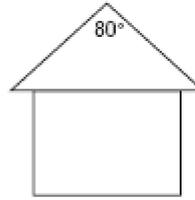


- a. 17.5
- b. 11.875
- c. 6
- d. 5

31. Two triangles are graphed with the following vertices:  $A(1, 1)$ ,  $B(0, 1)$ ,  $C(0, 0)$  and  $Q(-2, 1)$ ,  $R(-1, 1)$ ,  $S(-1, 0)$ . When a transformation is applied to  $\triangle ABC$ , the result is  $\triangle QRS$ . Which best describes the transformation?

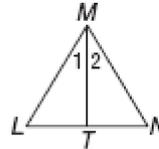
- a.  $\triangle QRS$  is a translation of  $\triangle ABC$
- b.  $\triangle QRS$  is a rotation of  $\triangle ABC$
- c.  $\triangle QRS$  is a reflection of  $\triangle ABC$
- d.  $\triangle QRS$  and  $\triangle ABC$  are not congruent

32. A triangular-shaped roof of a house has congruent legs. What is the measure of each of the two base angles?



- a. 25
- b. 50
- c. 100
- d. 120

Use the figure below to answer the following questions.



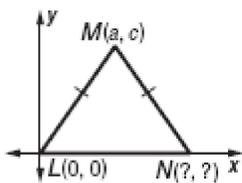
33. If  $\triangle LMN$  is isosceles and  $T$  is the midpoint of  $\overline{LN}$ , which postulate can be used to prove  $\triangle MLT \cong \triangle MNT$ ?

- a. AAA
- b. AAS
- c. SAS
- d. ABC

34. If  $\triangle MLT \cong \triangle MNT$ , what is used to prove  $\angle 1 \cong \angle 2$ ?

- a. CPCTC
- b. definition of isosceles triangle
- c. definition of perpendicular
- d. definition of angle bisector

35. What are the missing coordinates of this triangle?



- a.  $(2a, 2c)$
- b.  $(2a, 0)$
- c.  $(0, 2a)$
- d.  $(a, 2c)$

*Solve the equation by factoring.*

36.  $x^2 + 8x - 33 = 0$

37.  $2x^2 + 3x - 14 = 0$

38.  $2x^2 + x - 10 = 0$

39.  $4x^2 + 8x + 4 = 0$

40.  $x^2 + 6x - 72 = 0$

41.  $x^2 + 5x - 50 = 0$