

Geometry Semester 1 Model Problems

 (California Essential Standards) Short Answer

GS 1.0

1. List the undefined terms in Geometry.

2. Match each of the terms with the corresponding example

- a. A theorem.
- b. A conjecture.
- c. An axiom (postulate).
- d. An undefined term.
- e. Inductive Reasoning.
- f. Deductive Reasoning.

U. Every student in Mr. Smith's class drew a quadrilateral, measured the interior angles, and found the sum. They discovered that all of their sums were the same and generalized this was true for every quadrilateral.

V. Shelly used a piece of paper as a model of a plane and described it in her notes.

W. Rueben found a property of rhombi, but does not know if it can be proven to be true.

X. Yasmine noticed that all rectangles have opposite sides congruent and then found a way to prove this was true.

Y. Rachel used a property of parallelograms to calculate the lengths of the sides of a polygon on her homework.

Z. Andrew noticed that the relationship between corresponding angles has not been proven, but is accepted as true and is used to prove that other angle relationships are true.

GS 3.0

3. **GRAM** is a parallelogram. If $GR = RA$, which of the following *must* also be true?

- a. **GRAM** is a square
- b. **GRAM** is a rhombus
- c. **GRAM** is a rectangle
- d. $GA = RM$

4. **LATR** is a parallelogram. If $\angle L \cong \angle A$, and $m\angle L + m\angle A = 180^\circ$, which of the following *must* also be true?

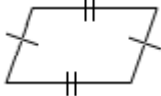
- a. **LATR** is a square
- b. **LATR** is a rhombus
- c. **LATR** is a rectangle
- d. $LT \perp AR$

5.

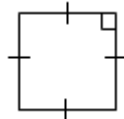
All rectangles are squares.

Which of the following diagrams is a counterexample to the statement?

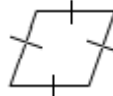
a.



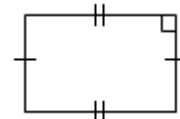
b.



c.



d.

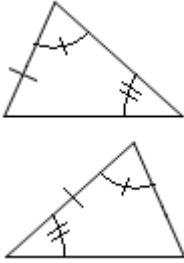


6.

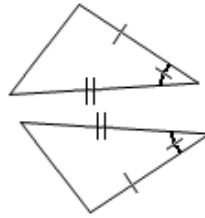
If two triangles have two pairs of angles congruent and one pair of sides congruent, then the two triangles are congruent.

Which of the following diagrams is a counterexample to the statement?

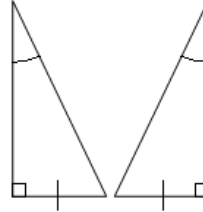
a.



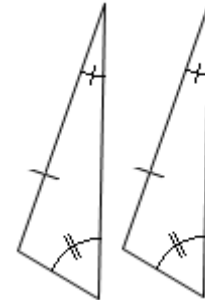
b.



c.

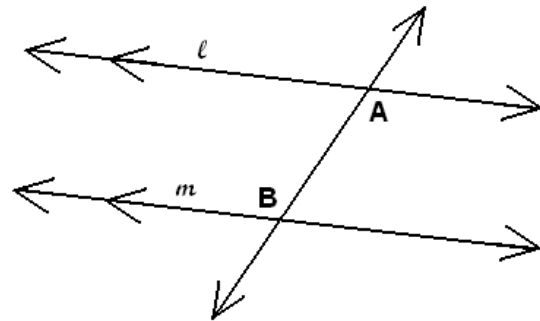


d.



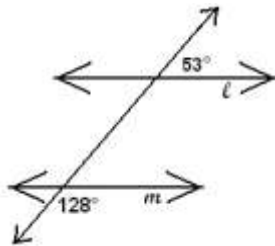
GS 7.0

7. In the diagram, lines ℓ and m are parallel. What relationship exists between angles A and B? What postulate or theorem supports that relationship?

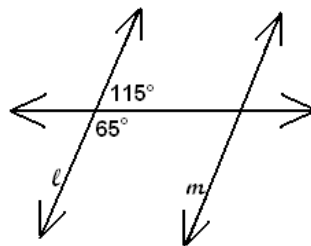


8. Lines ℓ and m are shown in each diagram. In which diagram MUST lines ℓ and m be parallel?

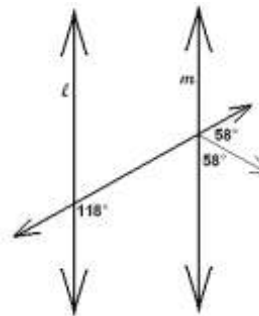
a.



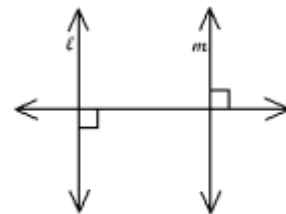
b.



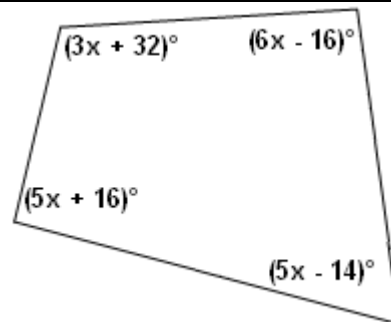
c.



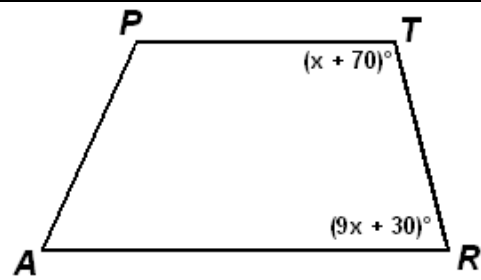
d.



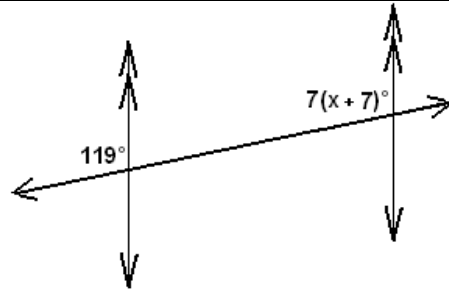
9. For the quadrilateral shown, what is the value of x ?



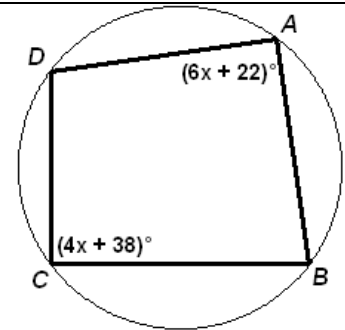
10. In the diagram, quadrilateral $TRAP$ is a trapezoid in which $\overline{TP} \parallel \overline{RA}$. What is the value of x ?



11. In the diagram shown, what is the value of x ?



12. Quadrilateral $ABCD$ is circumscribed by a circle, as shown in the diagram to the right. What is the measure of $\angle C$?

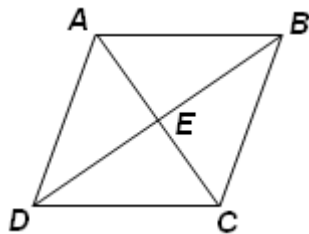


GS 5.0

13. Given: $ABCD$ is a rhombus and \overline{AC} bisects \overline{DB} .

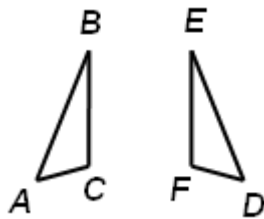
Which theorem or postulate listed below could be used to prove that $\triangle AED \cong \triangle AEB$?

Prove: $\triangle AED \cong \triangle AEB$



14. In the diagram below, $\angle A \cong \angle D$ and $\angle B \cong \angle E$.

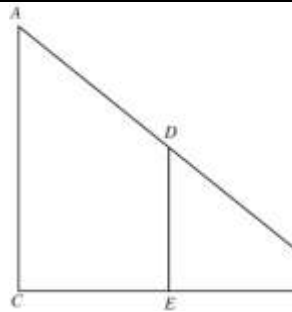
What additional information would be enough to prove that $\triangle ABC \cong \triangle DEF$?



GS 4.0

15. If $\triangle LMN$ and $\triangle PQR$ have sides $\overline{LM} \cong \overline{PQ}$ and $\overline{MN} \cong \overline{QR}$, which pair of angles would need to be congruent to be sufficient to prove that $\triangle LMN \cong \triangle PQR$?

16.



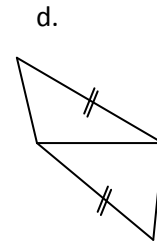
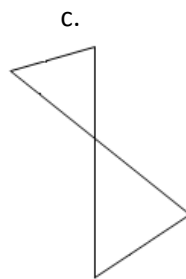
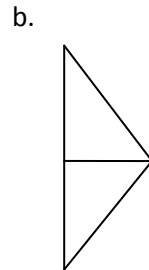
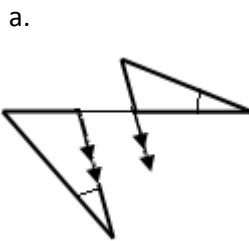
Which of the following facts would be sufficient to prove that $\triangle ABC$ is similar to $\triangle DBE$?

- a. $CE = BE$
- b. $\angle ACE$ is a right angle
- c. \overline{AC} is parallel to \overline{DE}
- d. $\angle A \cong \angle B$

17. Which two must be similar?

- a. Two isosceles right triangles
- b. Two isosceles trapezoids
- c. Two rhombi
- d. Two rectangles

18. Which triangles *must* be similar?



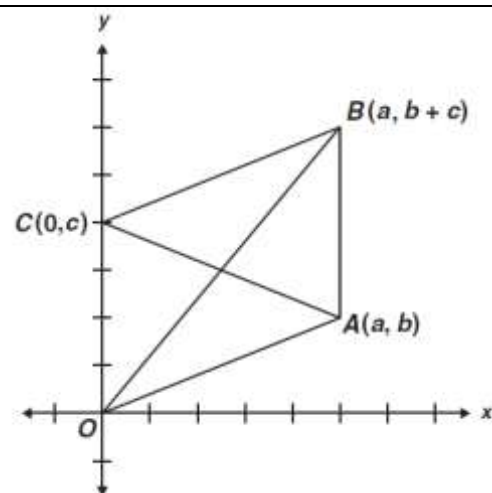
19. In quadrilateral $QUAD$, \overline{QU} is parallel to \overline{DA} . If \overline{QD} is not congruent to \overline{UA} , then which statement below *must* also be true?

- a. $m\angle Q + m\angle A = 180^\circ$
- b. $\angle U \cong \angle A$
- c. $QUAD$ is a parallelogram.
- d. $QUAD$ is a trapezoid.

GS 17.0

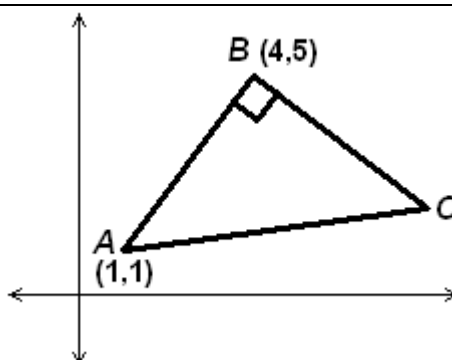
20. In the diagram, $ABCO$ is a parallelogram.

What are the coordinates of the intersection of the diagonals?



21. In the diagram, $\triangle ABC$ is a right triangle.

What is the slope of \overline{BC} ?



GS 6.0

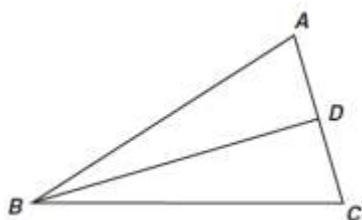
22. If two sides of a triangle are 6 inches and 10 inches, what is the smallest whole number length that could be the third side? Describe the triangle inequality theorem.

GS 2.0

23. Theorem: A triangle has at most one obtuse angle.

Eduardo is proving the theorem above by contradiction. He began by assuming that in $\triangle ABC$, $\angle A$ and $\angle B$ are both obtuse. What theorem will Eduardo use to reach a contradiction?

24. Use the proof to answer the question below.



Given: $\overline{AB} \cong \overline{BC}$; D is the midpoint of \overline{AC}

Prove: $\triangle ABD \cong \triangle CBD$

STATEMENT	REASON
1. $\overline{AB} \cong \overline{BC}$; D is the midpoint of \overline{AC}	1. Given
2. $\overline{AD} \cong \overline{CD}$	2. Definition of midpoint
3. $\overline{BD} \cong \overline{BD}$	3. Reflexive Property
4. $\triangle ABD \cong \triangle CBD$	4. ?

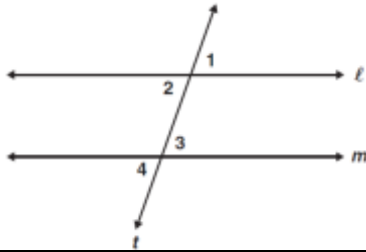
Which triangle equality theorem or postulate can be used as a correct reason for step 4?

25.

Use the proof to answer the question below.

Given: $\angle 2 \cong \angle 3$

Prove: $\angle 1 \cong \angle 4$



STATEMENT	REASON
1. $\angle 2 \cong \angle 3$	1. Given
2. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	2. ?
3. $\angle 1 \cong \angle 4$	3. Transitive Property

What reason can be used to justify step 2?

GS 12.0

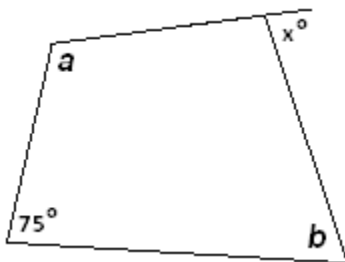
26. A hexagon with angles that measure $(5x)^\circ$, $(5x - 35)^\circ$, $(5x)^\circ$, $(6x)^\circ$, $(5x)^\circ$, and $(2x + 72)^\circ$. What is the value of x ?

27. The sum of the measures of 3 of the exterior angles of a pentagon is 210° . If the remaining exterior angles are congruent, what is the measure of each?

28. The measure of each exterior angle of a regular polygon is 18° . How many sides does the polygon have?

29. The measure of each interior angle of a regular polygon is 157.5° . How many sides does the polygon have?

30.



What is the sum of the measures of $\angle a$ and $\angle b$?

31. What is the measure of the interior angle of a regular polygon with 10 sides?