

Cumulative Test, Chapters 1-3

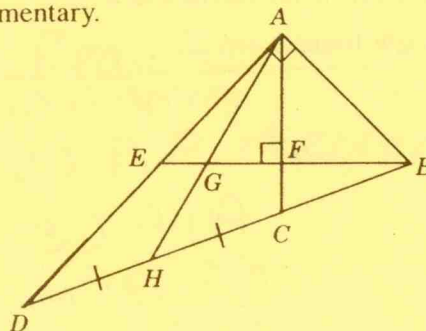
Directions: Write answers in the spaces provided.

Complete each statement with the word *always*, *sometimes*, or *never*.

1. Collinear points are ? on one line.
2. Two noncoplanar lines ? intersect.
3. A bisector of a segment ? intersects the segment at its midpoint.
4. If two angles are complementary, then they are ? adjacent angles.
5. If a triangle is isosceles, then it is ? a right triangle.
6. Vertical angles are ? congruent.
7. If an angle is acute, then its supplement is ? acute.
8. If a polygon is equilateral, then it is ? a regular polygon.
9. If two lines form congruent adjacent angles, then the lines are ? perpendicular.
10. If two planes intersect, then they are ? parallel.
11. If two lines are parallel, then they are ? coplanar.
12. The sum of the measures of the exterior angles of a convex polygon, one at each vertex, is ? equal to the sum of the measures of the interior angles of that polygon.
13. If a triangle has one acute angle and one right angle, then the third angle is ? obtuse.
14. A definition can ? be written as a biconditional.
15. A conclusion based on inductive reasoning is ? true.
16. Two lines perpendicular to the same line are ? parallel.

Given the diagram, state whether you can reach the conclusion shown.

17. $AF + FC = AC$
18. $\overline{AE} \cong \overline{ED}$
19. $\angle EGA \cong \angle HGB$
20. \overline{HA} bisects \overline{DC} .
21. $\angle EAF$ and $\angle BAF$ are complementary.
22. \overrightarrow{AH} bisects $\angle DAC$.
23. $\angle AFB \cong \angle BFC$



Questions 17-23

Answers

1. A (1)
2. N (1)
3. A (1)
4. S (1)
5. S (1)
6. A (1)
7. N (1)
8. S (1)
9. A (1)
10. N (1)
11. A (1)
12. S (1)
13. N (1)
14. A (1)
15. S (1)
16. S (2)
17. yes (2)
18. no (2)
19. yes (2)
20. yes (2)
21. yes (2)
22. no (2)
23. yes (2)

(continued)

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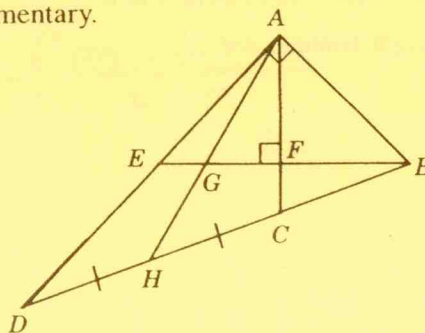
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(continued)

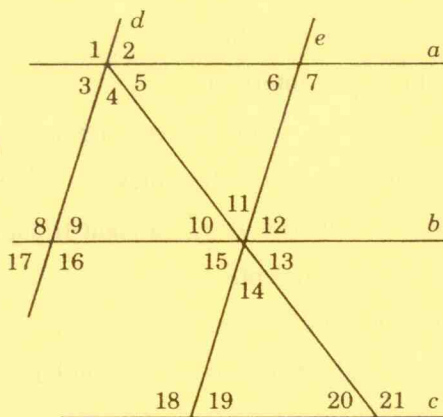
(continued)

In each exercise some information is given. Use this information to name the lines that must be parallel. If there are no such lines, write *none*.

24. $\angle 4 \cong \angle 11$
 25. $\angle 9 \cong \angle 19$
 26. $\angle 7$ and $\angle 19$ are supplementary.
 27. $\angle 10 \cong \angle 20$
 28. $m\angle 4 + m\angle 5 + m\angle 9 = 180$

Given $d \parallel e$, state whether you can reach the conclusion shown.

29. $\angle 2 \cong \angle 12$
 30. $\angle 15$ and $\angle 16$ are supplementary.
 31. $\angle 9 \cong \angle 12$
 32. $\angle 5 \cong \angle 10$



Questions 24–32

Complete each statement.

33. The sum of the measures of the angles of a triangle is ?.
 34. The measure of each angle of an equiangular triangle is ?.
 35. A polygon that has 10 sides is called a(n) ?.
 36. The measure of an exterior angle of a triangle is equal to the sum of the measures of its ? interior angles.
 37. An angle whose measure is 180 is called a(n) ? angle.
 38. If the sum of the measures of two angles is 90, then the angles are called ? angles.
 39. Reasoning that involves drawing conclusions based on past observations is called ? reasoning.
 40. If two planes intersect, then their intersection is a ?.
 41. Noncoplanar lines are called ? lines.
 42. If two lines intersect, then their intersection is a ?.
 43. The acute angles of a right triangle are ?.

Answers

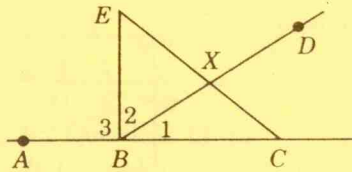
24. d || e (2)
 25. none (2)
 26. a || c (2)
 27. b || c (2)
 28. a || b (2)
 29. no (2)
 30. yes (2)
 31. yes (2)
 32. no (2)
 33. 180° (2)
 34. 60° (2)
 35. decagon (2)
 36. remote (2)
 37. straight (2)
 38. complementary (2)
 39. inductive (2)
 40. line (2)
 41. skew (2)
 42. point (2)
 43. complementary (2)

(continued)

(Continued)

Write the name or statement of the definition, postulate, or theorem that justifies each statement.

Given: X is the midpoint of \overline{BD} ;
 $\overline{EB} \perp \overline{BC}$



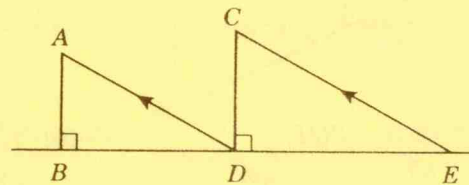
44. $m\angle ABD + m\angle 1 = 180$ Def. of linear pair
45. $BX = \frac{1}{2}BD$ midpoint Theorem
46. $\angle 3$ is a right angle. Def of \perp lines
47. $\angle 3 \cong \angle EBC$ Perp. Th. (P.T.)
48. $\angle EXB \cong \angle DXC$ V.A.T.
49. Use the conditional: Two angles are congruent if they are right angles.
- Write the hypothesis. they are right \angle 's
 - Write the conclusion. two angles are \cong
 - Write the converse. If two angles are \cong , then they are right angles.

50. The sum of the measures of four angles of a pentagon is 405. Find the measure of the fifth angle.
51. Find the measure of one exterior angle of a regular octagon.
52. Given a triangle with two congruent angles that each measure 50, find the measure of the third angle.
53. Write a two-column proof.

Given: $\overline{AB} \perp \overline{BE}$; $\overline{CD} \perp \overline{BE}$;
 $\overline{AD} \parallel \overline{CE}$

Prove: $\angle A \cong \angle C$

Proof:



Answers

44. (See question) (2)
45. (See question) (2)
46. (See question) (2)
47. (See question) (2)
48. (See question) (2)
49. a. (See question) (2)
- b. (See question) (2)
- c. (See question) (2)
50. 135° (2)
51. 45° (2)
52. 80° (2)
53. (See proof) (7)

- | | |
|---|-----|
| 1.) $\overline{AB} \perp \overline{BE}$, $\overline{CD} \perp \overline{BE}$ | ST. |
| 2.) $\overline{AB} \parallel \overline{CD}$ | |
| 3.) $\angle A \cong \angle ADC$ | |
| 4.) $\overline{AD} \parallel \overline{CE}$ | |
| 5.) $\angle C \cong \angle ADC$ | |
| 6.) $\angle A \cong \angle C$ | |

- | | |
|-------------------|---------|
| 1.) given. | Reasons |
| 2.) P.P. Theorem. | |
| 3.) AIA | |
| 4.) given | |
| 5.) AIA | |
| 6.) substitution | |

Chapter 4 Test

Directions: Write answers in the spaces provided.

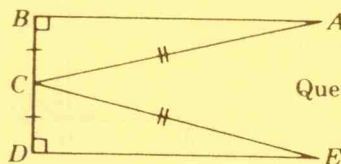
Complete each statement.

1. $\triangle ABC \cong$?

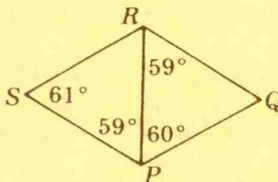
2. $\angle ACB \cong$?

3. $\overline{BA} \cong$?

4. $\triangle PQR \cong$?



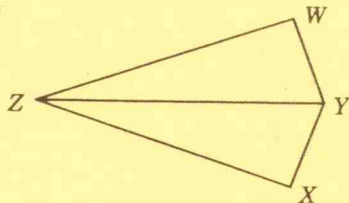
Questions 1-3



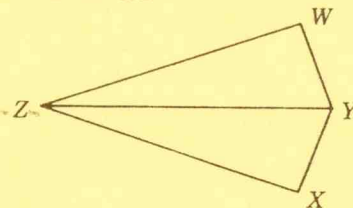
Question 4

Using the given information, decide whether the two triangles must be congruent. If so, (a) write the congruence and (b) name the postulate or theorem that justifies your answer. If not, write *none* for both (a) and (b).

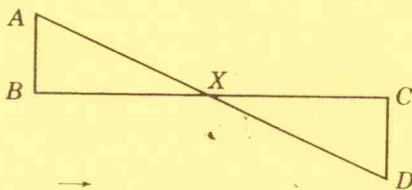
5. $\overline{WY} \cong \overline{XY}$; $\overline{WZ} \cong \overline{XZ}$



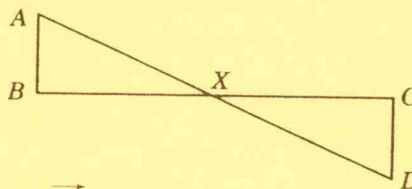
6. $\angle W$ and $\angle X$ are right angles;
 $\overline{WY} \cong \overline{XY}$



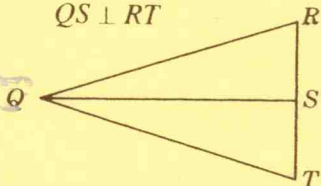
7. X is the midpoint of \overline{BC} ;
 $\overline{AB} \cong \overline{DC}$



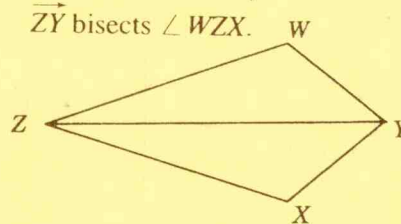
8. \overline{AD} bisects \overline{BC} ;
 \overline{BC} bisects \overline{AD} .



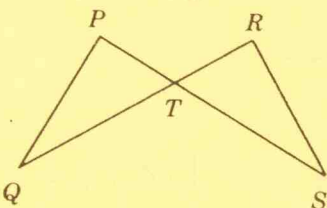
9. \overrightarrow{QS} bisects $\angle RQT$;
 $\overline{QS} \perp \overline{RT}$



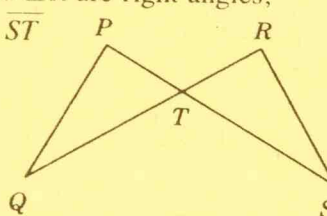
10. \overrightarrow{YZ} bisects $\angle WYX$;
 \overrightarrow{ZY} bisects $\angle WZX$.



11. $\overline{PQ} \cong \overline{RS}$; $\overline{QT} \cong \overline{ST}$



12. $\angle P$ and $\angle R$ are right angles;
 $\overline{QT} \cong \overline{ST}$



Answers

1. $\triangle EDC$ (2)

2. $\angle ECD$ (2)

3. \overline{DE} (2)

4. $\triangle RSP$ (3)

5. a. $\triangle WYZ \cong \triangle XYZ$ (2)

b. SSS (2)

6. a. $\triangle WYZ \cong \triangle XYZ$ (2)

b. $H-L$ (2)

7. a. *none* (2)

b. *none* (2)

8. a. $\triangle ABX \cong \triangle DCX$ (2)

b. SAS (2)

9. a. $\triangle RQS \cong \triangle TQS$ (2)

b. ASA (2)

10. a. $\triangle WYZ \cong \triangle XYZ$ (2)

b. ASA (2)

11. a. *none* (2)

b. *none* (2)

12. a. $\triangle PQT \cong \triangle RST$ (2)

b. SAA (2)

(continued)

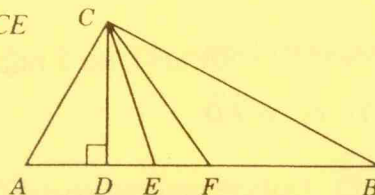
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Given: $\overline{CD} \perp \overline{AB}$; $\overline{AF} \cong \overline{BF}$; $\angle ACE \cong \angle BCE$

13. Name an altitude of $\triangle ABC$.

14. Name a median of $\triangle ABC$.

15. Name an angle bisector.

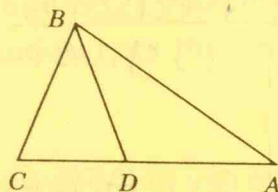


Questions 13-15

16. If $\angle BCD \cong \angle BDC$, name two segments that must be congruent.

17. If $\overline{AC} \cong \overline{AB}$, name two angles that must be congruent.

18. If $m\angle DAB = 20$ and $m\angle DBA = 20$, name two segments that must be congruent.

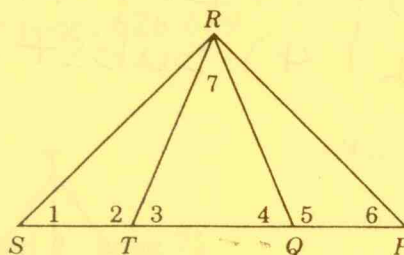


Questions 16-18

19. If $\overline{RS} \cong \overline{RP}$ and $m\angle 1 = 40$, then $m\angle 6 = ?$.

20. If $\overline{RT} \cong \overline{RQ}$ and $m\angle 7 = 50$, then $m\angle 4 = ?$.

21. If $\overline{RT} \cong \overline{RQ}$ and $m\angle 2 = 100$, then $m\angle 7 = ?$.

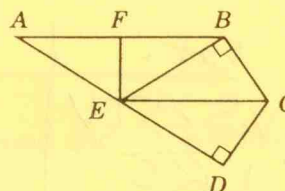


Questions 19-22

22. If $\angle 1 \cong \angle 6$, $RS = 2x + 6$, $RT = 2x + 4$, $RQ = 3x - 2$, and $RP = 3x - 1$, then $x = ?$.

23. If \overline{EF} is the perpendicular bisector of \overline{AB} , then $\overline{EB} \cong ?$.

24. If \overrightarrow{CE} bisects $\angle DCB$, then $\overline{EB} \cong ?$.



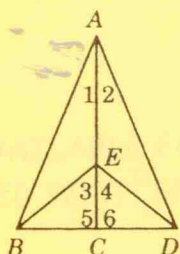
Questions 23, 24

25. Supply the missing statements and reasons.

Given: $\angle 1 \cong \angle 2$; $\angle 5 \cong \angle 6$

Proof:

Prove: \overrightarrow{EC} bisects $\angle BED$.



Statements

Reasons

1. $\angle 1 \cong \angle 2$; $\angle 5 \cong \angle 6$

2. $\overline{AC} \cong \overline{AC}$

3. $\triangle ACB \cong \triangle ACD$

4. $\overline{BC} \cong \overline{DC}$

5. $\overline{CE} \cong \overline{CE}$

6. $\triangle ECB \cong \triangle ECD$

7. $\angle 3 \cong \angle 4$

8. \overrightarrow{EC} bisects $\angle BED$.

1. Given

2. Reflexive

3. ASA

4. CPCTC

5. Reflexive

6. SAS

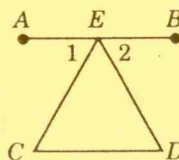
7. CPCTC

8. Def. of angle bisector

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Write proofs in two-column form.

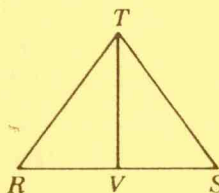
26. Given: $\overline{AB} \parallel \overline{CD}$; $\overline{EC} \cong \overline{ED}$ Prove: $\angle 1 \cong \angle 2$ 

Answers

26. (See proof)

27. (See proof)

St.	Reasons
1) $\overline{AB} \parallel \overline{CD}$	1) given
2) $\overline{EC} \cong \overline{ED}$	
2) $\angle 1 \cong \angle C$ $\angle 2 \cong \angle D$	2) AIA
3) $\angle C \cong \angle D$	3) I.T.T.
4) $\angle 1 \cong \angle 2$	4) Subst.

27. Given: $\angle RTV \cong \angle STV$; $\overline{TV} \perp \overline{RS}$ Prove: $\overline{RT} \cong \overline{ST}$ 

St.	Reasons
1) $\angle RTV \cong \angle STV$	1) given
2) $\overline{TV} \perp \overline{RS}$	
2) $\angle TVR \cong \angle TVS$	2) Perp. Th. (P.T.)
3) $\overline{TV} \cong \overline{TV}$	3) Reflexive
4) $\triangle TVR \cong \triangle TVS$	4) ASA
5) $\overline{RT} \cong \overline{ST}$	5) CPCTC

CHALLENGE (Optional)

ANSWER

How many pairs of triangles shown can be proved congruent?

16

