

**Geometry Test – Unit 4a**  
**Triangle Relationships**

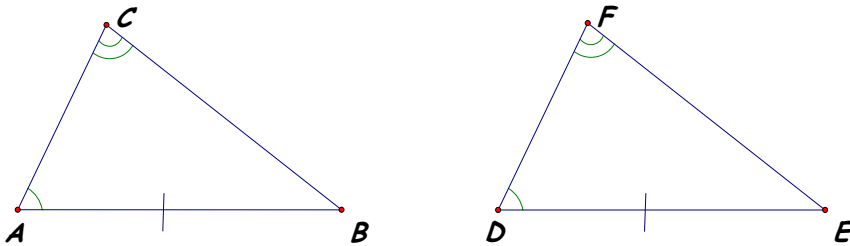
☺ **Name:** \_\_\_\_\_ ☺

**Date:** \_\_\_\_\_ **Pd:** \_\_\_\_\_

*Definitions (1-4)*

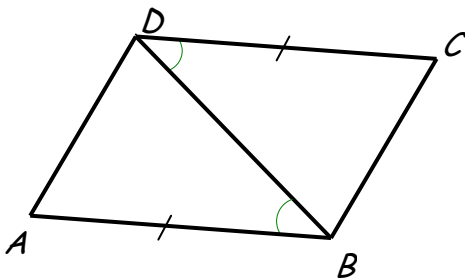
- 1) Equilateral triangle
- 2) Base angles of an isosceles triangle
- 3) Hypotenuse Leg Theorem (HL)
- 4) Exterior Angle Theorem
- 5) Draw and label all parts of a(n): (mark all congruent sides and angles)
  - a) right triangle.
  - b) isosceles triangle.

- 6) Which, if any, congruence theorem or postulate would prove the triangles are congruent?



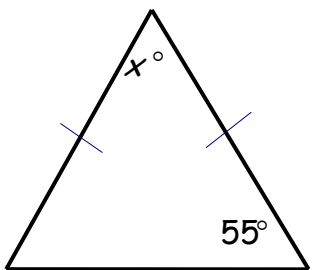
Write a congruence statement if possible: \_\_\_\_\_

- 7) Which, if any, congruence theorem or postulate would prove the triangles are congruent?

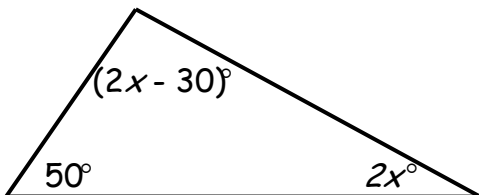


Write a congruence statement if possible: \_\_\_\_\_

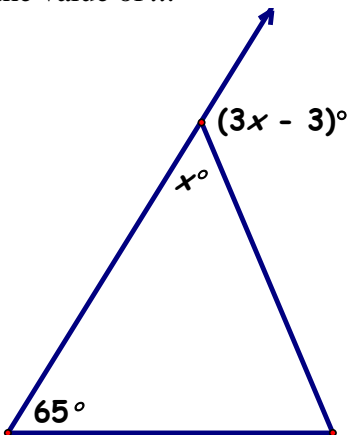
- 8) Find the value of  $x$ .



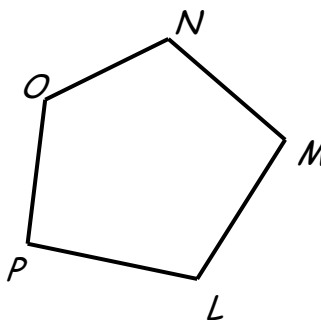
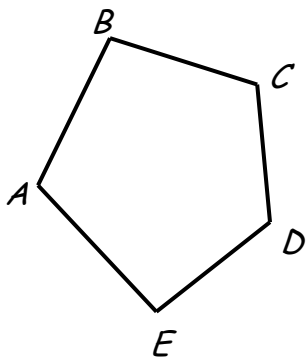
- 9) Find the value of  $x$ .



- 10) Find the value of  $x$ .



- 11) In the figure below,  $ABCDE \cong LMNOP$ . Which angle of  $LMNOP$  corresponds to  $\angle DEA$ ?



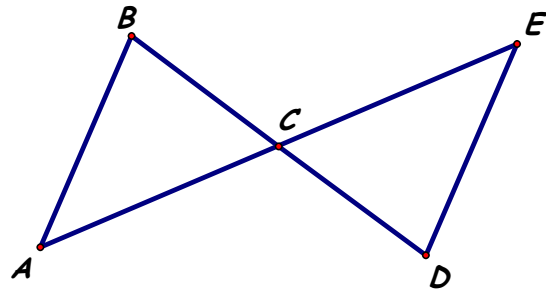
- 12) Given that  $\triangle ABC \cong \triangle XYZ$ ,  $BC = 2(3x - 10)$  and  $YZ = (-x + 15)$ , find the value of  $x$ .  
HINT – Draw & label the picture!

- 13) Given that  $\triangle GHI \cong \triangle JKL$ ,  $m\angle H = (5x + 28)^\circ$ ,  $m\angle I = (3x + 41)^\circ$ , and  $m\angle J = (2x + 11)^\circ$ , find  $m\angle K$ . HINT – Draw & label the picture!

- 14) Fill in the blank:  
CPCTC can only be used \_\_\_\_\_ proving two triangles are \_\_\_\_\_.  
State the reason for the statement in Step 4.

Given:  $\overline{AE}$  and  $\overline{BD}$  bisect each other at  $C$

Prove:  $\overline{DE} \cong \overline{BA}$

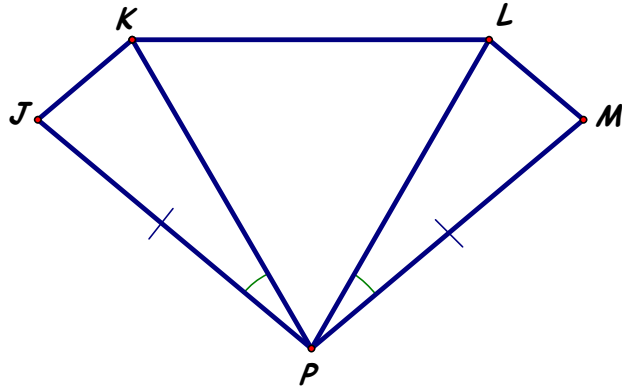


Statements	Reasons
1) $\overline{AE}$ and $\overline{BD}$ bisect each other at $C$	1) Given
2) $\overline{AC} \cong \overline{CE}$	2) Def. of bisect
3) $\overline{BC} \cong \overline{CD}$	3) Def. of bisect
4) $\angle ACB \cong \angle DCE$	4) _____
5) $\triangle ABC \cong \triangle EDC$	5) SAS
6) $\overline{DE} \cong \overline{BA}$	6) CPCTC

15) Write a two-column proof.

Given:  $\triangle KPL$  is equilateral,  
 $\overline{JP} \cong \overline{MP}$ ,  
 $\angle JPK \cong \angle MPL$

Prove:  
 $\triangle JPK \cong \triangle MPL$

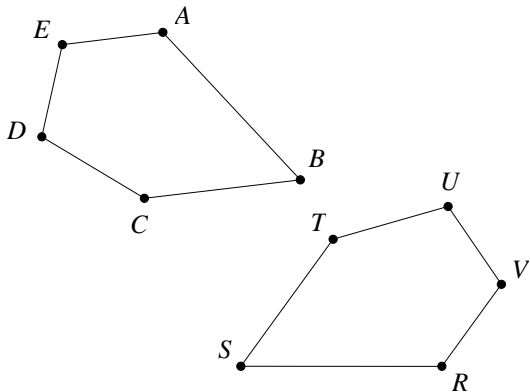


**Semester Exam Review**

16. Which is a valid classification for a triangle?

- A. equilateral scalene
- B. isosceles scalene
- C. obtuse isosceles
- D. right acute

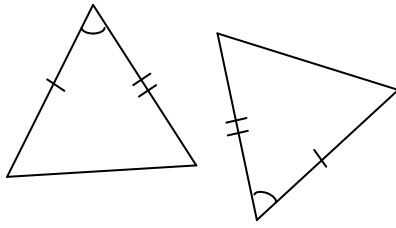
17. In the diagram,  $ABCDE \cong RSTUV$ .



Which side of  $ABCDE$  corresponds to  $\overline{VR}$  ?

- A.  $\overline{CB}$
- B.  $\overline{DC}$
- C.  $\overline{EA}$
- D.  $\overline{ED}$

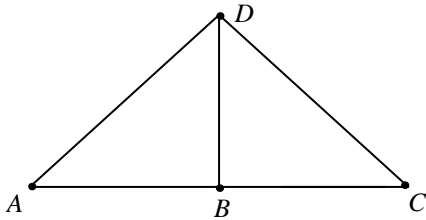
18. Use the triangles.



Which congruence postulate or theorem proves these two triangles are congruent?

- A. angle-angle-angle (AAA)
- B. angle-side-angle (ASA)
- C. side-angle-side (SAS)
- D. side-side-side (SSS)

19. In the diagram,  $\overline{AD} \cong \overline{CD}$  and  $B$  is the midpoint of  $\overline{AC}$ .



Which congruence postulates or theorems would prove these two triangles are congruent?

- I. side-side-angle (SSA)
  - II. side-angle-side (SAS)
  - III. side-side-side (SSS)
- A. II only
  - B. III only
  - C. I and II only
  - D. II and III only

20. Given that  $\triangle RST \cong \triangle XYZ$ ,  $m\angle R = (3b + 20)^\circ$ ,  $m\angle Y = 40^\circ$ , and  $m\angle Z = 45^\circ$ , what is the value of  $b$ ?

- A.  $21\frac{2}{3}$
- B. 25
- C.  $38\frac{1}{3}$
- D. 95

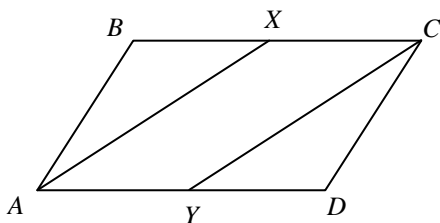
21. Given that  $\triangle PQR \cong \triangle JKL$ ,  $JK = 3x + 9$ ,  $KL = 2x$ ,  $LJ = 6x$ , and  $PQ = 5x - 3$ ; what is the value of  $x$ ?

- A. -1
- B. 1
- C. 3
- D. 6

22. The statements for a proof are given below.

**Given:** Parallelogram  $ABCD$   
 $\angle AXB \cong \angle CYD$

**Prove:**  $\overline{AX} \cong \overline{CY}$



**Proof:**

STATEMENTS	REASONS
1. Parallelogram $ABCD$ $\angle AXB \cong \angle CYD$	1.
2. $\angle B \cong \angle D$	2.
3. $\overline{AB} \cong \overline{CD}$	3.
4. $\triangle ABX \cong \triangle CDY$	4.
5. $\overline{AX} \cong \overline{CY}$	5.

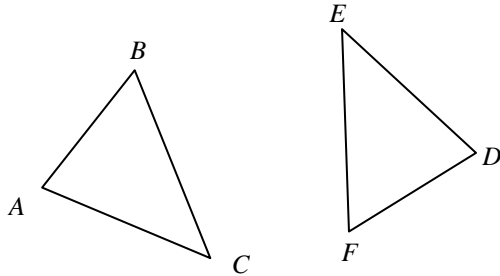
What reason makes the statement in Step 4 true?

- A. angle-angle-side (AAS)
- B. angle-side-angle (ASA)
- C. side-angle-side (SAS)
- D. side-side-side (SSS)

23. The statements for a proof are given below.

Given:  $\overline{AB} \cong \overline{FD}$   
 $\angle A \cong \angle D$   
 $\angle F \cong \angle B$

Prove:  $\overline{BC} \cong \overline{EF}$



Proof:

STATEMENTS	REASONS
1. $\overline{AB} \cong \overline{FD}$	1.
2. $\angle A \cong \angle D$	2.
3. $\angle F \cong \angle B$	3.
4. $\triangle ABC \cong \triangle DFE$	4.
5. $\overline{BC} \cong \overline{EF}$	5.

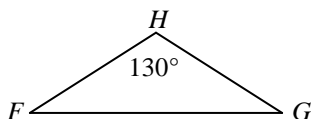
What reason makes the statement in Step 5 true?

- A. corresponding parts of congruent triangles are congruent. (CPCTC)
- B. angle-side-angle (ASA)
- C. side-angle-angle (SAA)
- D. given

24. Given that  $\triangle DEF \cong \triangle LMN$ ,  $m\angle D = (5x - 10)^\circ$ ,  $m\angle L = (4x + 10)^\circ$ , and  $DF = 3(x + 5)$ ; what is  $LN$ ?

- A. 15
- B. 20
- C. 65
- D. 75

25. In the isosceles triangle,  $m\angle H = 130^\circ$ .

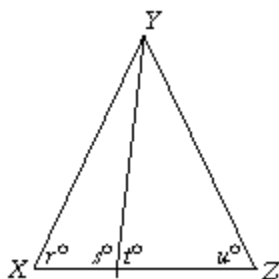


What is the measure of  $\angle G$ ?

- A.  $25^\circ$
- B.  $35^\circ$
- C.  $50^\circ$
- D.  $65^\circ$

**SAT Review**

26. If  $\triangle XYZ$  is equilateral, what is the value of  $r + s + t + u$ ?

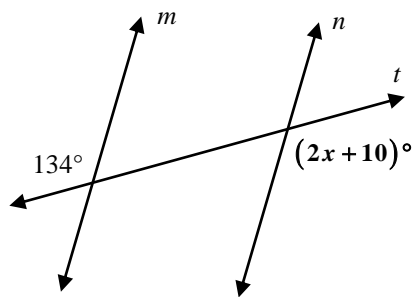


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5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9



27. (LTMR) In the diagram,  $m \parallel n$  and  $t$  is a transversal.



What is the value of  $x$ ?

28. (LTMR) What is the slope of any line perpendicular to  $y = .5x - 3$ .