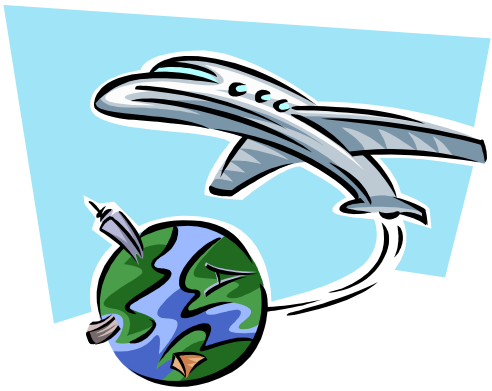
Review Unit 4B - The Amazing Geometry Race
"Congruent Triangles"

You are about to embark on another amazing race. Your destination this time is the exotic *Far East*. You will travel from city to city, solving geometry problems as you go. You will use the space below to document your answers and evidence of your journey.

Use the map to find the capital city of the 1st country you will visit. Write the name of the capital in the space below. Go to that capital's location in the classroom to get the set of problems for that location. Each person is to do every problem, showing his/her work on a separate sheet of paper. The group is to reach consensus and put their answers in the spaces below. When all problems in a country have been solved, ONE person should check the answers. If the answers and work are satisfactory, the next country to visit will be given to the team. Continue until all countries have been visited and all problems solved. You are NOT to proceed to the next set of problems until everyone has finished the current set. As you go from one country to the next, trace your path on the map, labeling the countries A - G.



Country:	Country:	Country:
City:	City:	City:
1.	13.	17.
2.	14.	18.
3.	15.	19.
4.	16a.	20a.
5.	16b.	20b.
6.	16c.	20c.
7.	16d.	20d.
8.	16e.	20e.
9.	16f.	20f.
10.		20g.
11.		20h.
12.		

Country:	Country:	Country:	Country:
City:	City:	City:	City:
21.	27.	34.	Put answers on clue page.
22.	28.	35.	
23.	29.	36.	
24. $\triangle ARO \cong$ by	30.	37.	
25. $\triangle RQM \cong$ by	31.	38.	
26. $\triangle AON \cong$ by	32.	39.	
	33.	40.	

Asia


RUSSIA
CHINA
INDIA
INDONESIA
KAZAKHSTAN
MONGOLIA
IRAN
AFGHANISTAN
PAKISTAN
BURMA
THAILAND
VIETNAM
LAOS
CAMBODIA
PHILIPPINES
MALAYSIA
JAPAN
NORTH KOREA
SOUTH KOREA
TAIWAN
BANGLADESH
NEPAL
BHUTAN
SRI LANKA
MALDIVES
AUSTRALIA
Arctic Ocean
Indian Ocean
Pacific Ocean
Norwegian Sea
Barents Sea
Kara Sea
Laptev Sea
East Siberian Sea
Bering Sea
Sea of Okhotsk
Sea of Japan
East China Sea
South China Sea
Philippine Sea
Arabian Sea
Bay of Bengal
Andaman Sea
Java Sea
Celebes Sea
Banda Sea
Timor Sea
Moscow
Beijing
Tokyo
Seoul
Pyongyang
Ulaanbaatar
Astana
New Delhi
Islāmābād
Kābul
Tehrān
Baghdad
Riyadh
Jakarta
Manila
Bangkok
Hanoi
Rangoon
Dhaka
Kathmandu
Thimphu
Lhasa
Ürümqi
Scale 1:48,000,000
Azimuthal Equal-Area Projection
0 800 Kilometers
0 800 Miles
Boundary representation is not necessarily authoritative.
802726AI (R02105) 11-00

Sapporo, Japan

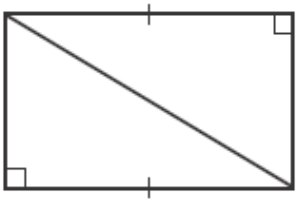
Sapporo was the location of the 1972 Winter Olympics. These were the first Olympic Winter games held in Asia.

Chapter Test (continued) Form A

Chapter 4

State the postulate or theorem you would use to prove each pair of triangles congruent. If the triangles cannot be proved congruent, write *not possible*.

1.



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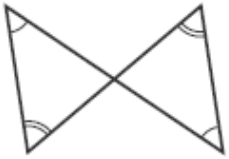

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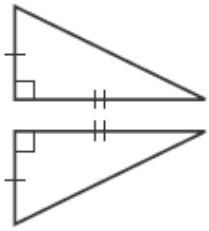

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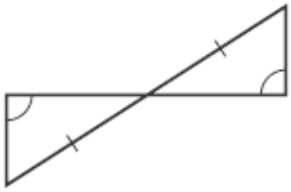

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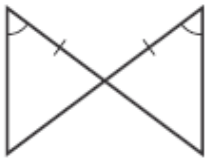

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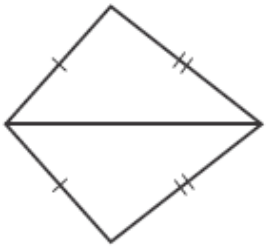

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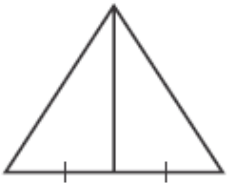

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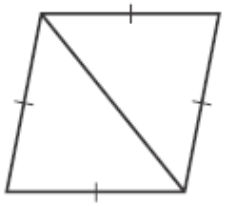
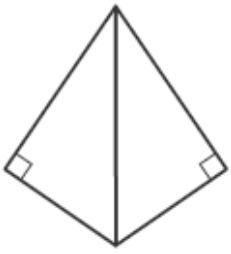


9.

10.



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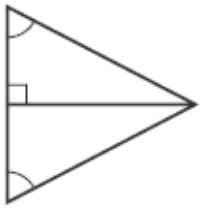

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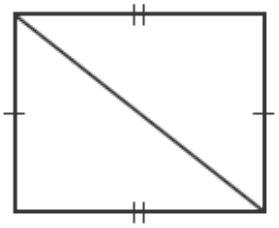


Mandalay, Burma

Burma is also known as Myanmar. Around 88% of the population in Myanmar is Buddhist. Burmese is the official language. Mandalay is noted for the Arakan Pagoda, a Buddhist religious center.

Choose the best answer.

13. If $\triangle ABC \cong \triangle DEF$, how do you know that $\angle B \cong \angle E$?

A. Definition of triangle **B.** CPCTC

C. SSS Postulate **D.** AAS Theorem

14. Given: $\triangle PQR \cong \triangle STU$, and the coordinates of P, Q, R, S, and T are as follows: $P(-2, 0)$, $Q(0, 0)$, $R(1, 5)$, $S(4, 4)$, $T(6, 4)$. What are the coordinates of point U?

A. $(7, 9)$ **B.** $(5, 9)$ **C.** $(9, 3)$ **D.** $(9, 1)$

15. If $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \parallel \overline{BC}$, how do you know that $\triangle ABC \cong \triangle CDA$?

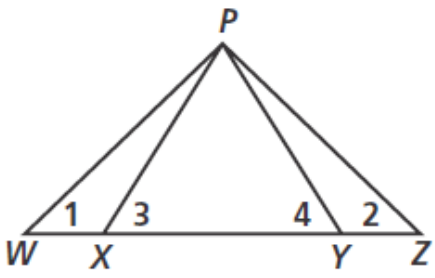
A. HL Theorem **B.** SSS Postulate

C. ASA Postulate **D.** CPCTC

16. Complete the following two-column proof by providing the best possible reasons.

Given: $\angle 1 \cong \angle 2$
$\overline{WX} \cong \overline{ZY}$

Prove: $\angle 3 \cong \angle 4$



Statements	*Reasons*
1. $\overline{WX} \cong \overline{ZY}$	a. ?
2. $\angle 1 \cong \angle 2$	b. ?
3. $\overline{WP} \cong \overline{ZP}$	c. ?
4. $\triangle WXP \cong \triangle ZYP$	d. ?
5. $\overline{XP} \cong \overline{YP}$	e. ?
6. $\angle 3 \cong \angle 4$	f. ?

Hue, Vietnam

In the 1700s, Hue was the capital of Vietnam. The capital is now Hanoi. Hue is pronounced "huh-WAY". In the 1700s, Vietnam was controlled by Nguyen lords.

Chapter Test (continued) Form B

Chapter 4

Choose the best answer.

17. If two triangles are congruent by the AAS Theorem, which other theorem or postulate could you use to prove the triangles congruent?

A. HL Theorem **B.** CPCTC

C. SAS Postulate **D.** ASA Postulate

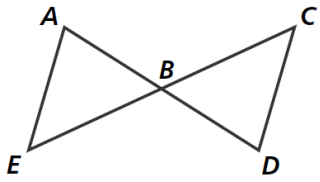
18. Given: $\triangle ABC \cong \triangle DEF$, and the coordinates of A, B, C, D, and E are as follows: $A(-3, 1)$, $B(0, 1)$, $C(2, 7)$, $D(4, 2)$, $E(1, 2)$. What are the coordinates of point F?

A. $(2, 7)$ **B.** $(8, 4)$ **C.** $(-1, 8)$ **D.** $(4, 8)$

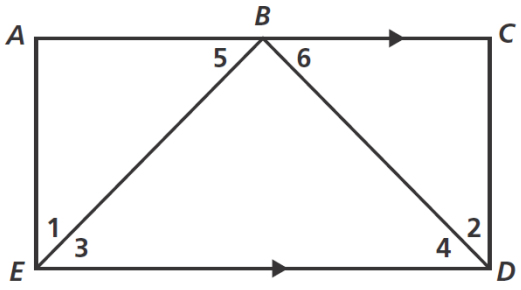
19. If $\overline{AE} \parallel \overline{CD}$, how do you know that $\triangle ABE \cong \triangle DBC$?

A. AAS Theorem **B.** ASA Postulate

C. SSS Postulate **D.** The triangles cannot be proved congruent from the given information.



20. Complete the following two-column proof by providing the best possible reasons.



Given: $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$
$\overline{AC} \parallel \overline{ED}$

Prove: $\overline{AB} \cong \overline{CB}$

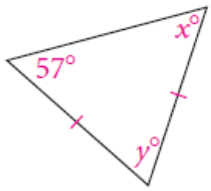
Statements	*Reasons*
1. $\angle 1 \cong \angle 2$	**a.** ?
2. $\angle 3 \cong \angle 4$	**b.** ?
3. $\overline{EB} \cong \overline{DB}$	**c.** ?
4. $\overline{AC} \parallel \overline{ED}$	**d.** ?
5. $\angle 5 \cong \angle 3$ and $\angle 6 \cong \angle 4$	**e.** ?
6. $\angle 5 \cong \angle 6$	**f.** ?
7. $\triangle ABE \cong \triangle CBD$	**g.** ?
8. $\overline{AB} \cong \overline{CB}$	**h.** ?

Nanjing, China

Nanjing is an ancient capital of 10 dynasties. It is also known as "Jinling", "Tianjing", and "Stone City". It was named Nanjing during the Ming Dynasty.

Find the value of each variable.

21.



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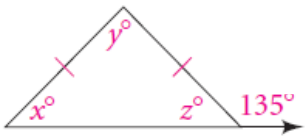

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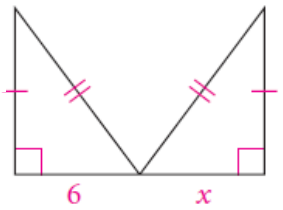
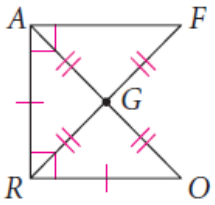
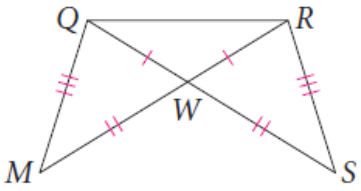


Lesson 4-7 **Name a pair of overlapping congruent triangles in each diagram. State whether the triangles are congruent by SSS, SAS, ASA, AAS, or HL.**

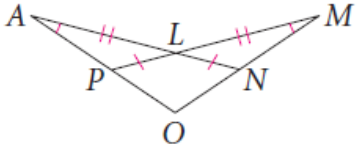
24.



25.



26.



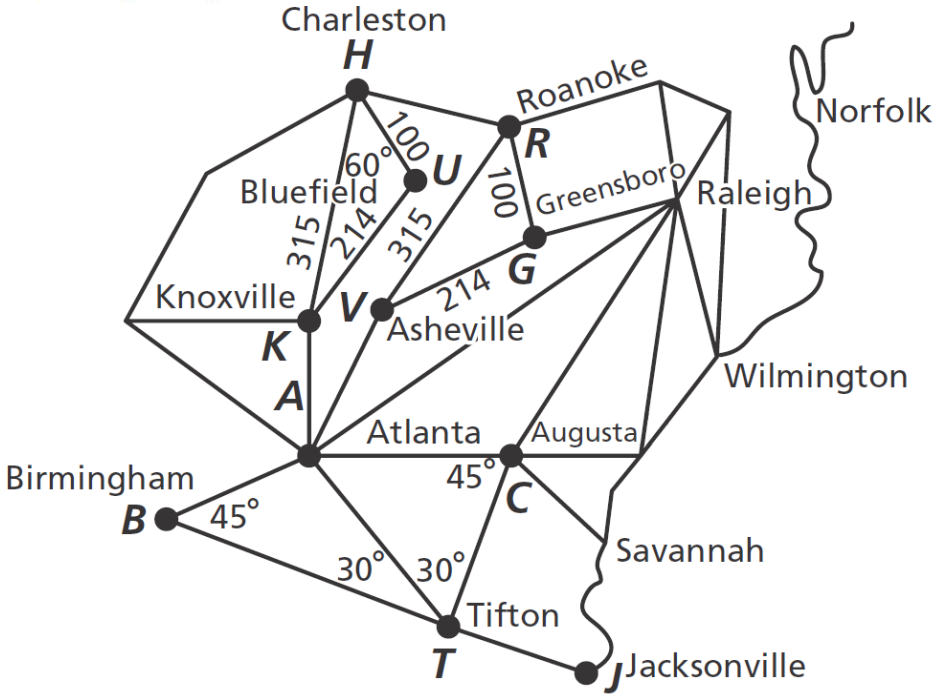
Bangalore, India

Bangalore is India's version of Silicon Valley. It is a center of aerospace and biotechnology research. It is said the name originated as "Benda Kalooru" or "town of boiled beans" in honor of a meal offered to an 11th century king.

Enrichment 4-4

Airplane Routes

The map shows some airplane routes between cities in the southern United States. Many of the routes form triangular figures.



Show that the route between Atlanta and Birmingham has the same length as the route between Atlanta and Augusta by completing each step below.

27. $\overline{AB}$ is a side of triangle _?_.

28. $\overline{AC}$ is a side of triangle _?_.

29. $m\angle ABT =$ _?_ and $m\angle ACT =$ _?_, so $\angle$_?_ $\cong \angle$_?_.

30. $m\angle ATB =$ _?_ and $m\angle ATC =$ _?_.

31. $\overline{AT} \cong \overline{AT}$. Why? _?_

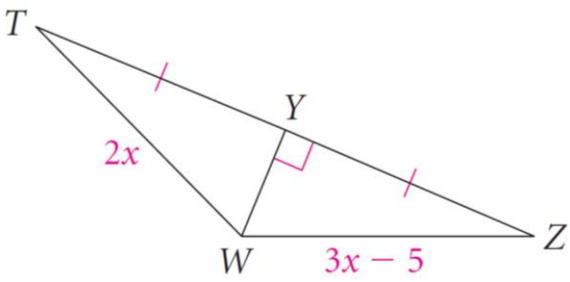
32. $\triangle ABT \cong \triangle ACT$. Why? _?_

33. $\overline{AB} \cong \overline{AC}$. Why? _?_

Bangkok, Thailand

Bangkok is also called Krung Thep Maha Nakhon in Thai. The traditional name of Bangkok is actually 21 names long and has been listed as the longest name for a place by the Guinness Book of World Records. Bangkok is known as the "City of Angles" due to its fascination with city planning.

For Exercises 34-36, use the diagram at the right.



34. Specifically describe the relationship of $\overleftrightarrow{WY}$ to $\overline{TZ}$.

35. Find WZ.

36. What kind of triangle is ΔTWZ?

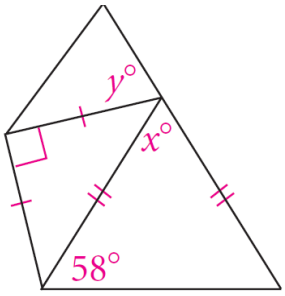
37. If R is on the perpendicular bisector of $\overline{TZ}$, then R is _____ from T and Z, or _____ = _____.

Chapter Test

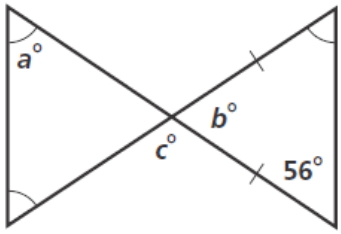
Chapter 4

Find the value of the variables and the requested information.

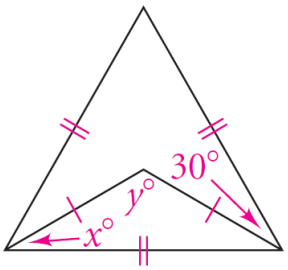
38. specifically describe the triangle in the middle of the diagram shown



39. relationship between the two triangles



40. type of triangles shown (larger first)



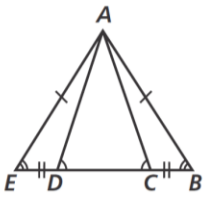
Kathmandu, Nepal

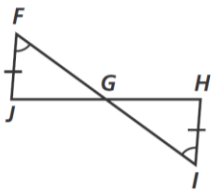
Kathmandu, the capital of Nepal, is the jumping off point for those wishing to climb Mount Everest. Perhaps you'll get to climb it one day!

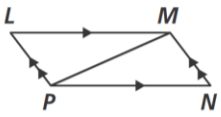
Enrichment 4-6

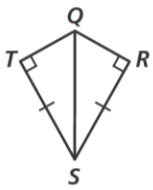
Congruent Triangles Crossword Puzzle

Use the figures below to fill in the blanks and complete the crossword puzzle.









ACROSS

3. $\angle QRS$ is a(n) _?_ angle.

7. $\triangle QRS \cong \triangle QTS$ by the _?_ Theorem.

8. $\overline{TS}$ is a(n) _?_ of $\triangle QTS$.

9. $\triangle LMP$ is a(n) _?_ triangle.

12. $\angle FGJ$ and $\angle HGI$ are _?_ angles.

13. $\triangle LPM \cong \triangle$ _?_.

14. $\triangle FGJ \cong \triangle IGH$ by the _?_ Theorem.

15. $\overline{PM} \cong \overline{PM}$ by the _?_ Property.

16. $\triangle ADB \cong \triangle$ _?_.

17. $\triangle ADE \cong \triangle ACB$ by the _?_ Postulate.

DOWN

1. By Theorem 4-1, $\angle FJG \cong \angle$ _?_.

2. $\overline{TS}$ and $\overline{RS}$ are _?_.

4. $\triangle ACD$ is a(n) _?_ triangle.

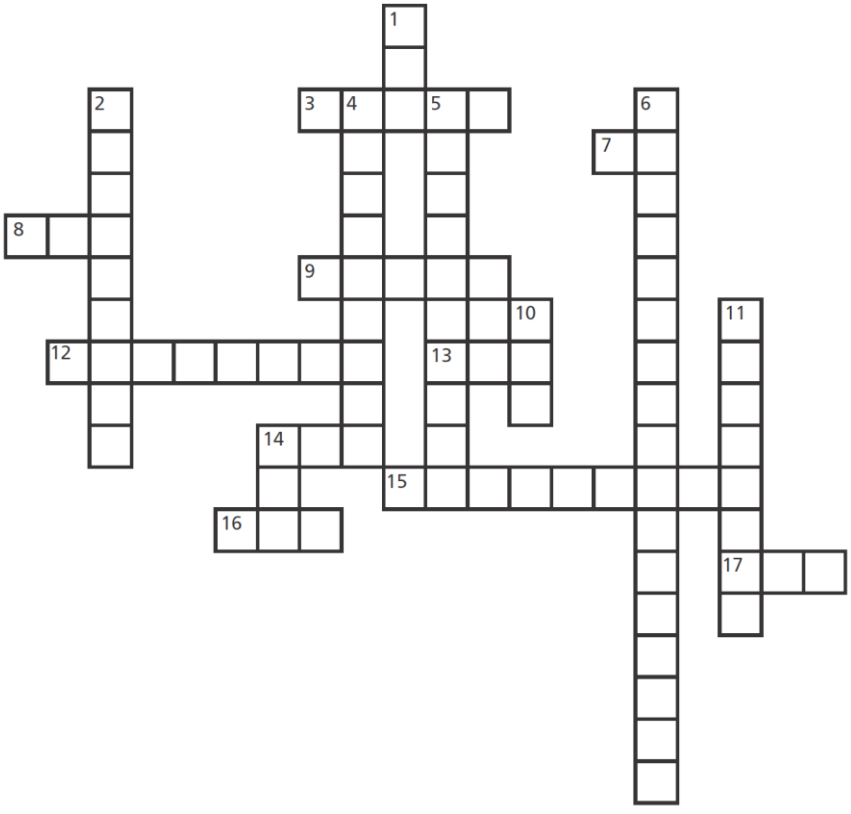
5. $\overline{QS}$ is the _?_ of $\triangle QRS$.

6. $\angle LMP$ and $\angle NPM$ are _?_ angles.

10. $\triangle LMP \cong \triangle$ _?_.

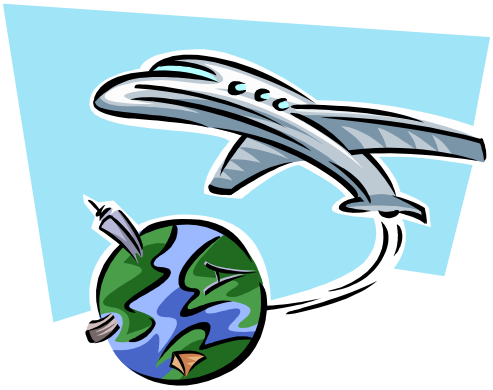
11. $\overline{AC} \cong \overline{AD}$ by the _?_ of the Isosceles Triangle Theorem.

14. $\angle AED \cong \angle$ _?_.



KEY - Review Unit 4B - The Amazing Geometry Race
"Congruent Triangles"

You are about to embark on another amazing race. Your destination this time is the exotic *Far East*. You will travel from city to city, solving geometry problems as you go. You will use the space below to document your answers and evidence of your journey.



Use the map to find the capital city of the 1st country you will visit. Write the name of the capital in the space below. Go to that capital's location in the classroom to get the set of problems for that location. Each person is to do every problem, showing his/her work on a separate sheet of paper. The group is to reach consensus and put their answers in the spaces below. When all problems in a country have been solved, ONE person should check the answers. If the answers and work are satisfactory, the next country to visit will be given to the team. Continue until all countries have been visited and all problems solved. You are NOT to proceed to the next set of problems until everyone has finished the current set. As you go from one country to the next, label each city visit with the letter A-G. Connect the points in the order you visited them. When finished, connect point G back to point A.

Country: **Japan**	Country: **Burma (Myanmar)**	Country: **Vietnam**
City A: **Sapporo**	City B: **Mandalay**	City C: **Hue**
1. HL Theorem	16. B	17. D
2. not possible	17. A	18. C
3. SAS Postulate	18. C	19. D
4. AAS Theorem	16a. Given	20a. Given
5. ASA Postulate	16b. Given	20b. Given
6. SSS Postulate	16c. Converse of Isosceles $\triangle$ Thm.	20c. Converse of Isosceles $\triangle$ Thm.
7. not possible	16d. SAS Postulate	20d. Given
8. SSS Postulate	16e. CPCTC	20e. Alternate Interior $\angle s$ Thm.
9. not possible	16f. Isosceles $\triangle$ Thm.	20f. Subst. Or Transitive Property
10. not possible		20g. ASA Postulate
11. AAS Theorem		20h. CPCTC
12. SSS Postulate		

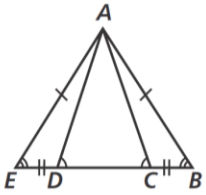
Country: **China**	Country: **India**	Country: **Thailand**	Country: **Nepal**
City D: **Nanjing**	City E: **Bangalore**	City F: **Bangkok**	City G: **Kathmandu**
21. x = 57, y = 66	27. $\triangle ABT$	34. perp. bisector of $\overline{TZ}$	Put answers on clue page. (see next page)
22. x = 45, y = 90, z = 45	28. $\triangle ACT$	35. 10	
23. x = 6	29. 45, 45, $\angle ABT \cong \angle ACT$	36. isosceles	
24. $\triangle ARO \cong \triangle RAF$ by HL Theorem	30. 30, 30,	37. equidistant, RT, RZ	
25. $\triangle RQM \cong \triangle QRS$ by SSS Postulate	31. Reflexive Prop. ($\cong$)	38. x = 64, y = 71, isosceles right triangle	
26. $\triangle AON \cong \triangle MOP$ by AAS Theorem	32. AAS Theorem	39. a = 56, b= 68, c =112, similar triangles	
	33. CPCTC	40. x = 30, y = 120, equilateral, isosceles	

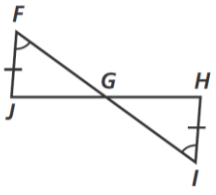
KEY - Review Unit 4B - The Amazing Geometry Race Kathmandu, Nepal

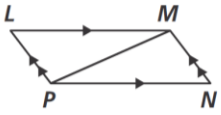
Enrichment 4-6

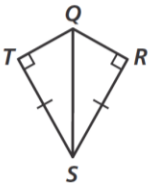
Congruent Triangles Crossword Puzzle

Use the figures below to fill in the blanks and complete the crossword puzzle.









ACROSS

3. $\angle QRS$ is a(n) _?_ angle.

7. $\triangle QRS \cong \triangle QTS$ by the _?_ Theorem.

8. $\overline{TS}$ is a(n) _?_ of $\triangle QTS$.

9. $\triangle LMP$ is a(n) _?_ triangle.

12. $\angle FGJ$ and $\angle HGI$ are _?_ angles.

13. $\triangle LPM \cong \triangle$ _?_.

14. $\triangle FGJ \cong \triangle IGH$ by the _?_ Theorem.

15. $\overline{PM} \cong \overline{PM}$ by the _?_ Property.

16. $\triangle ADB \cong \triangle$ _?_.

17. $\triangle ADE \cong \triangle ACB$ by the _?_ Postulate.

DOWN

1. By Theorem 4-1, $\angle FJG \cong \angle$ _?_.

2. $\overline{TS}$ and $\overline{RS}$ are _?_.

4. $\triangle ACD$ is a(n) _?_ triangle.

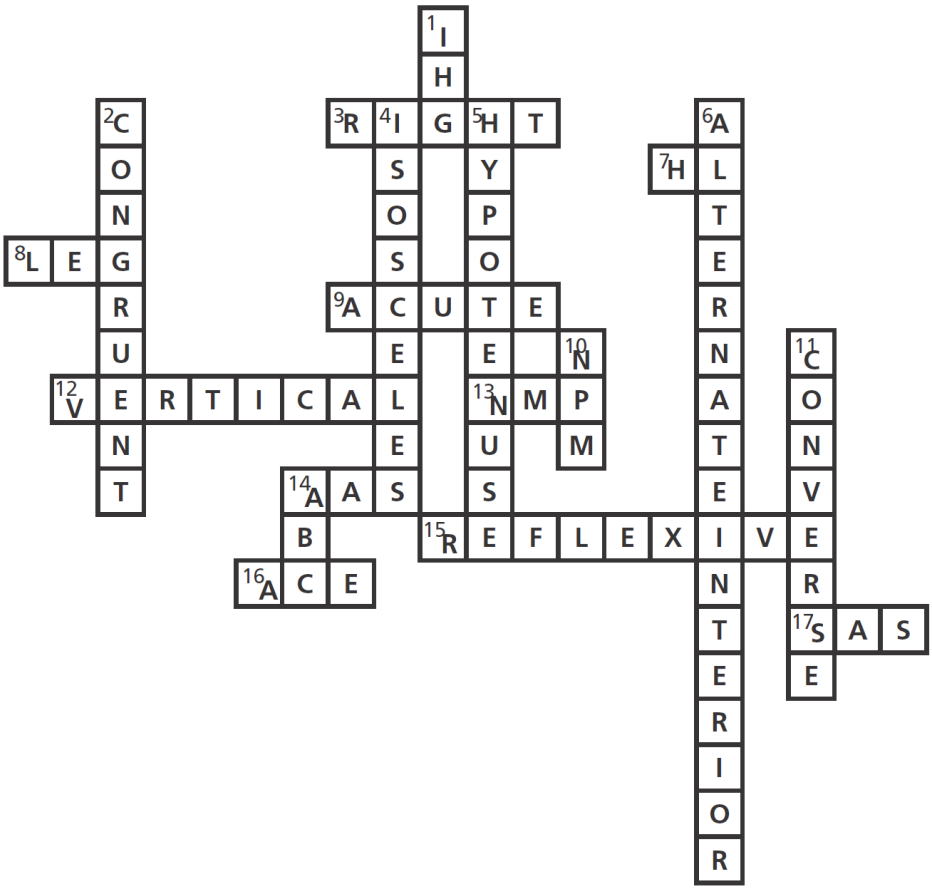
5. $\overline{QS}$ is the _?_ of $\triangle QRS$.

6. $\angle LMP$ and $\angle NPM$ are _?_ angles.

10. $\triangle LMP \cong \triangle$ _?_.

11. $\overline{AC} \cong \overline{AD}$ by the _?_ of the Isosceles Triangle Theorem.

14. $\angle AED \cong \angle$ _?_.



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Scale 1:48,000,000
Azimuthal Equal-Area Projection
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0 800 Miles
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