

4-1 Standardized Test Prep

Congruent Figures

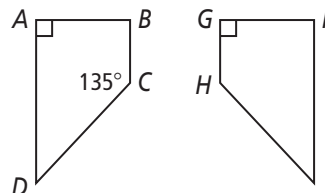
Multiple Choice

For Exercises 1–6, choose the correct letter.

1. The pair of polygons at the right is congruent. What is $m\angle J$?

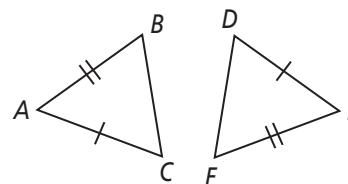
- (A) 45 (C) 135
 (B) 90 (D) 145

A



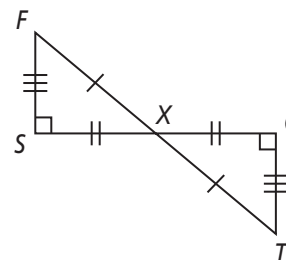
2. The triangles at the right are congruent. Which of the following statements must be true? **I**

- (F) $\angle A \cong \angle D$ (H) $\overline{AB} \cong \overline{DE}$
 (G) $\angle B \cong \angle E$ (I) $\overline{BC} \cong \overline{FD}$



3. Given the diagram at the right, which of the following must be true? **B**

- (A) $\triangle XSF \cong \triangle XTG$ (C) $\triangle FXS \cong \triangle XGT$
 (B) $\triangle SXF \cong \triangle GXT$ (D) $\triangle FXS \cong \triangle GXT$



4. If $\triangle RST \cong \triangle XYZ$, which of the following need not be true? **I**

- (F) $\angle R \cong \angle X$ (G) $\angle T \cong \angle Z$ (H) $\overline{RT} \cong \overline{XZ}$ (I) $\overline{SR} \cong \overline{YZ}$

5. If $\triangle ABC \cong \triangle DEF$, $m\angle A = 50$, and $m\angle E = 30$, what is $m\angle C$? **C**

- (A) 30 (B) 50 (C) 100 (D) 120

6. If $ABCD \cong QRST$, $m\angle A = x - 10$, and $m\angle Q = 2x - 30$, what is $m\angle A$? **F**

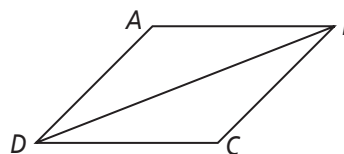
- (F) 10 (G) 20 (H) 30 (I) 40

[2] $\angle ABD \cong \angle CDB$ and $\angle ADB \cong \angle CBD$, both by the **Alt. Int Angles Thm.** So, by **Third Angles Thm.**, $\angle A \cong \angle C$. Because $\overline{DB} \cong \overline{BD}$ by the **Refl. Prop. of Congruence**, and we know $\overline{AB} \cong \overline{CD}$ and $\overline{AD} \cong \overline{CB}$, then all the corresponding parts are congruent and $\triangle ABD \cong \triangle CDB$.
[1] incomplete proof **[0]** no proof or incorrect proof

Short Response

7. Given: $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \parallel \overline{BC}$, $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{CB}$

Prove: $\triangle ABD \cong \triangle CDB$



4-2

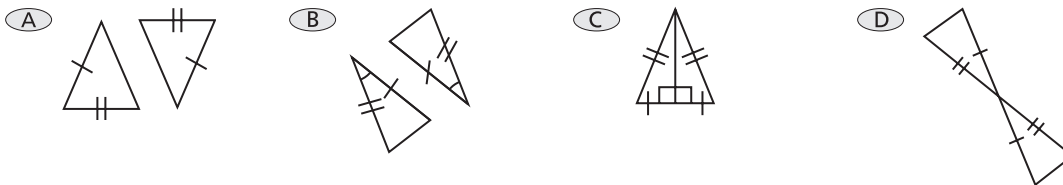
Standardized Test Prep

Triangle Congruence by SSS and SAS

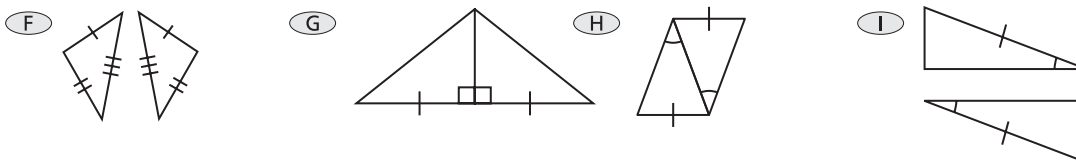
Multiple Choice

For Exercises 1-4, choose the correct letter.

1. Which pair of triangles can be proved congruent by SSS? **C**

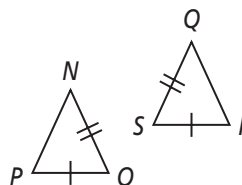


2. Which pair of triangles can be proved congruent by SAS? **G**



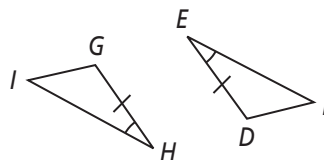
3. What additional information do you need to prove $\triangle NOP \cong \triangle QSR$? **D**

- (A) $\overline{PN} \cong \overline{SQ}$ (C) $\angle P \cong \angle S$
 (B) $\overline{NO} \cong \overline{QR}$ (D) $\angle O \cong \angle S$



4. What additional information do you need to prove $\triangle GHI \cong \triangle DEF$? **F**

- (F) $\overline{HI} \cong \overline{EF}$ (H) $\angle F \cong \angle G$
 (G) $\overline{HI} \cong \overline{ED}$ (I) $\overline{GI} \cong \overline{DF}$



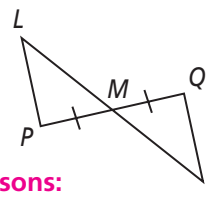
Short Response

5. Write a two-column proof.

Given: M is the midpoint of \overline{LS} , $\overline{PM} \cong \overline{QM}$.

Prove: $\triangle LMP \cong \triangle SMQ$

[2] **Statements:** 1) M is the midpoint of \overline{LS} ; 2) $\overline{LM} \cong \overline{SM}$;
 3) $\angle LMP \cong \angle SMQ$; 4) $\overline{PM} \cong \overline{QM}$; 5) $\triangle LMP \cong \triangle SMQ$; **Reasons:**
 1) Given; 2) Def. of a midpoint; 3) Vert. \triangle are \cong ; 4) Given;
 5) SAS [1] incomplete proof [0] incorrect or no proof



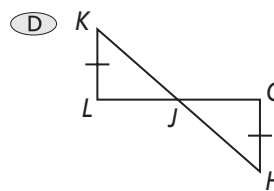
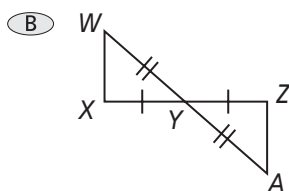
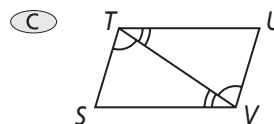
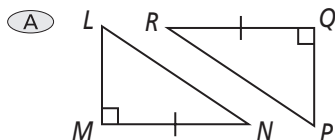
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Triangle Congruence by ASA and AAS

Multiple Choice

For Exercises 1–4, choose the correct letter.

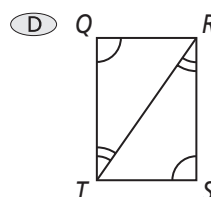
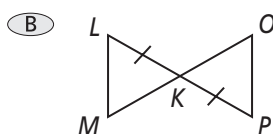
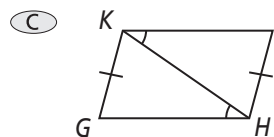
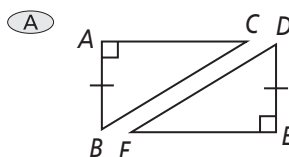
1. Which pair of triangles can be proven congruent by the ASA Postulate? **C**



2. For the ASA Postulate to apply, which side of the triangle must be known? **F**

- (F) the included side
 (H) the shortest side
 (G) the longest side
 (I) a non-included side

3. Which pair of triangles can be proven congruent by the AAS Theorem? **D**



4. For the AAS Theorem to apply, which side of the triangle must be known? **I**

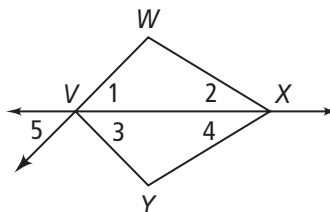
- (F) the included side
 (H) the shortest side
 (G) the longest side
 (I) a non-included side

Short Response

5. Write a paragraph proof.

Given: $\angle 3 \cong \angle 5$, $\angle 2 \cong \angle 4$

Prove: $\triangle VWX \cong \triangle VYX$



[2] $\angle 3 \cong \angle 5$ is given.
 $\angle 1 \cong \angle 5$ because vert.
 \triangle are \cong . $\angle 3 \cong \angle 1$ by the
 Trans. Prop. of \cong . $\angle 2 \cong \angle 4$
 is given. $VX \cong VX$ by the
 Refl. Prop. of \cong .
 $\triangle VWX \cong \triangle VYX$ by ASA.
 [1] incomplete proof
 [0] incorrect or no proof

4-4

Standardized Test Prep

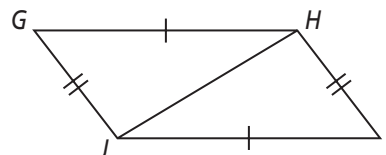
Using Corresponding Parts of Congruent Triangles

Multiple Choice

For Exercises 1–6, choose the correct letter.

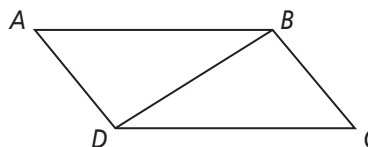
1. Based on the given information in the figure at the right, how can you justify that $\triangle JHG \cong \triangle HJI$? **B**

- (A) ASA (C) AAS
(B) SSS (D) ASA



2. In the figure at the right the following is true: $\angle ABD \cong \angle CDB$ and $\angle DBC \cong \angle BDA$. How can you justify that $\triangle ABD \cong \triangle CDB$? **H**

- (F) SAS (H) ASA
(G) SSS (I) CPCTC



3. $\triangle BRM \cong \triangle KYZ$. How can you justify that $\overline{YZ} \cong \overline{RM}$? **A**

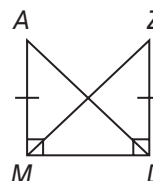
- (A) CPCTC (B) SAS (C) ASA (D) SSS

4. Which statement *cannot* be justified given only that $\triangle PBJ \cong \triangle TIM$? **I**

- (F) $\overline{PB} \cong \overline{TI}$ (G) $\angle B \cong \angle I$ (H) $\angle BJP \cong \angle IMT$ (I) $\overline{JP} \cong \overline{MI}$

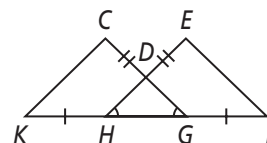
5. In the figure at the right, which theorem or postulate can you use to prove $\triangle ADM \cong \triangle ZMD$? **C**

- (A) ASA (C) SAS
(B) SSS (D) AAS



6. In the figure at the right, which theorem or postulate can you use to prove $\triangle KGC \cong \triangle FHE$? **H**

- (F) ASA (H) SAS
(G) SSS (I) AAS

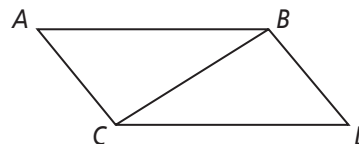


Short Response

7. What would a brief plan for the following proof look like?

Given: $\overline{AB} \cong \overline{DC}$, $\angle ABC \cong \angle DCB$

Prove: $\overline{AC} \cong \overline{DB}$



[2] $\overline{CB} \cong \overline{BC}$ by the Reflexive Property. $\triangle CBD \cong \triangle BCA$ by SAS. $\overline{AC} \cong \overline{DB}$ by CPCTC;
[1] one step missing or one reason incorrect [0] incorrect or no response

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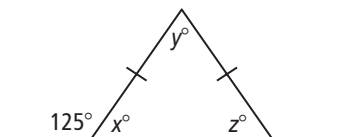
Isosceles and Equilateral Triangles

Gridded Response

Solve each exercise and enter your answer on the grid provided.

Refer to the diagram for Exercises 1–3.

1. What is the value of x ?



2. What is the value of y ?

3. What is the value of z ?

4. The measures of two of the sides of an equilateral triangle are $3x + 15$ in. and $7x - 5$ in. What is the measure of the third side in inches?

5. In $\triangle GHI$, $HI = GH$, $m\angle IHG = 3x + 4$, and $m\angle IGH = 2x - 24$. What is $m\angle HIG$?

Answers

1. **55**

−	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
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2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
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9	9	9	9	9	9	9	9	9	9	9

2. **70**

−	0	1	2	3	4	5	6	7	8	9
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7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

3. **55**

−	0	1	2	3	4	5	6	7	8	9
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3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

4. **30**

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

5. **40**

−	0	1	2	3	4	5	6	7	8	9
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3	3	3	3	3	3	3	3	3	3	3
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5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
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4-6 Standardized Test Prep

Congruence in Right Triangles

Multiple Choice

For Exercises 1-4, choose the correct letter.

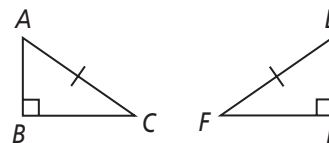
1. Which additional piece of information would allow you to prove that the triangles are congruent by the HL theorem? **C**

(A) $m\angle DFE = 40$

(C) $\overline{AB} \cong \overline{DE}$

(B) $m\angle F = m\angle ABC$

(D) $\overline{AC} \cong \overline{DF}$



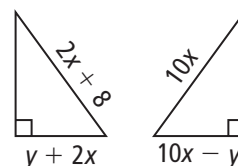
2. For what values of x and y are the triangles shown congruent? **F**

(F) $x = 1, y = 4$

(H) $x = 4, y = 1$

(G) $x = 2, y = 4$

(I) $x = 1, y = 3$



3. Two triangles have two pairs of corresponding sides that are congruent. What else must be true for the triangles to be congruent by the HL Theorem? **D**

(A) The included angles must be right angles.

(B) They have one pair of congruent angles.

(C) Both triangles must be isosceles.

(D) There are right angles adjacent to just one pair of congruent sides.

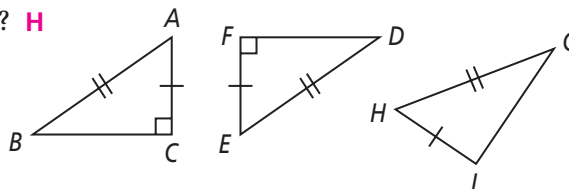
4. Which of the following statements is true? **H**

(F) $\triangle BAC \cong \triangle GHI$ by SAS.

(G) $\triangle DEF \cong \triangle GHI$ by SAS.

(H) $\triangle BAC \cong \triangle DEF$ by HL.

(I) $\triangle DEF \cong \triangle GHI$ by HL.

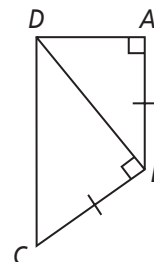


Extended Response

5. Are the given triangles congruent by the HL Theorem? Explain.

[4] No; they are right triangles, and have a pair of congruent legs ($\overline{AB} \cong \overline{BC}$), but the hypotenuses, \overline{DB} and \overline{DC} , are not congruent. So, the triangles only meet two of the three conditions for congruence by the HL Theorem.

[3] appropriate response plus a discussion of two of the three criteria for congruence [2] recognition only that the hypotenuses are not congruent [1] recognition that the triangles are not congruent [0] incorrect or no response



4-7

Standardized Test Prep

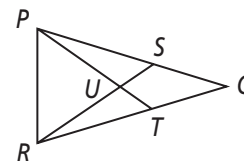
Congruence in Overlapping Triangles

Multiple Choice

For Exercises 1–5, choose the correct letter.

1. What is the common angle of $\triangle PQT$ and $\triangle RSQ$? **A**

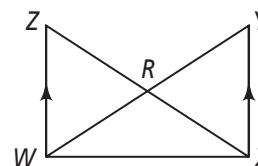
- (A) $\angle PQT$ (C) $\angle SRQ$
 (B) $\angle SPT$ (D) $\angle SUT$



Use the following information for Exercises 2–5.

Given: $\triangle ZWX \cong \triangle YXW$, $\overline{ZW} \parallel \overline{YX}$

Prove: $\triangle ZWR \cong \triangle YRX$



2. Which corresponding parts statement is needed to prove $\triangle ZWR \cong \triangle YRX$? **H**

- (F) $\angle ZWR \cong \angle YXR$ (H) $ZW = YX$
 (G) $\angle Z \cong \angle R$ (I) $WX = WX$

3. A classmate writes the statement $\angle ZRW \cong \angle YRX$ to help prove the congruence of the triangles. What reason should the classmate give? **D**

- (A) Given
 (B) Angles cut by a bisector are congruent.
 (C) Base angles of an isosceles triangle are congruent.
 (D) Vertical angles are congruent.

4. After using the congruence statements from Exercises 2 and 3, which statement can be used to prove the triangles congruent? **F**

- (F) $\angle Z \cong \angle Y$ (H) $\overline{WX} \cong \overline{WX}$
 (G) $\angle ZWR \cong \angle RYX$ (I) $\overline{WR} \cong \overline{RX}$

5. Which theorem or postulate will prove $\triangle ZWR \cong \triangle YRX$? **D**

- (A) SAS (B) SSS (C) ASA (D) AAS

Short Response

6. In the diagram at the right, which two triangles should be proved congruent first to help prove $\triangle ABF \cong \triangle EDF$?

[2] $\triangle ACD$ and $\triangle ECB$ [1] Correct \triangle named but vertices do not correspond. [0] incorrect \triangle named

