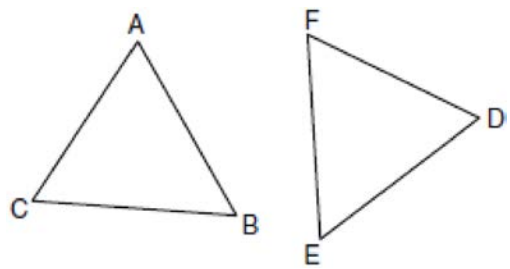
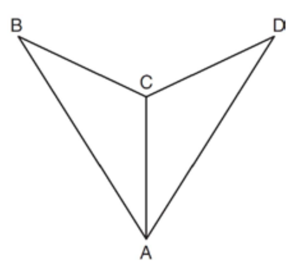
G.SRT.B.5: Triangle Proofs 1

1 In the diagram of $\triangle ABC$ and $\triangle DEF$ below, $\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, and $\angle B \cong \angle E$.



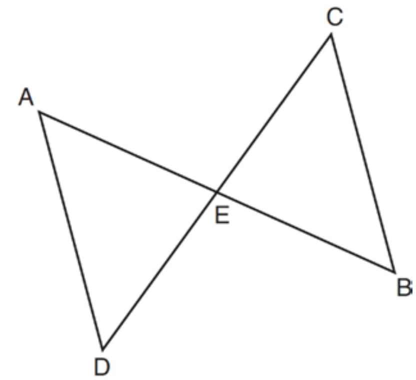
Which method can be used to prove $\triangle ABC \cong \triangle DEF$?
1) SSS
2) SAS
3) ASA
4) HL

2 As shown in the diagram below, $\overline{AC}$ bisects $\angle BAD$ and $\angle B \cong \angle D$.



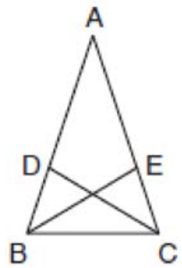
Which method could be used to prove $\triangle ABC \cong \triangle ADC$?
1) SSS
2) AAA
3) SAS
4) AAS

3 In the diagram below of $\triangle DAE$ and $\triangle BCE$, $\overline{AB}$ and $\overline{CD}$ intersect at E, such that $\overline{AE} \cong \overline{CE}$ and $\angle BCE \cong \angle DAE$.



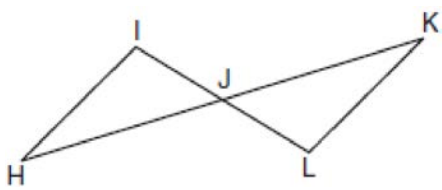
Triangle DAE can be proved congruent to triangle BCE by
1) ASA
2) SAS
3) SSS
4) HL

4 In the accompanying diagram of $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $\overline{BD} = \frac{1}{3}\overline{BA}$, and $\overline{CE} = \frac{1}{3}\overline{CA}$.



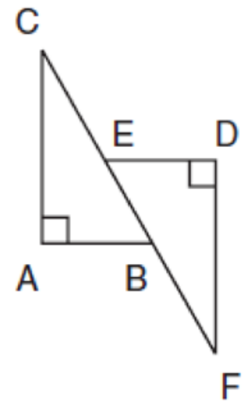
Triangle *EBC* can be proved congruent to triangle *DCB* by
1) SAS ≅ SAS
2) ASA ≅ ASA
3) SSS ≅ SSS
4) HL ≅ HL

5 In the accompanying diagram, $\overline{HK}$ bisects $\overline{IL}$ and $\angle H \cong \angle K$.



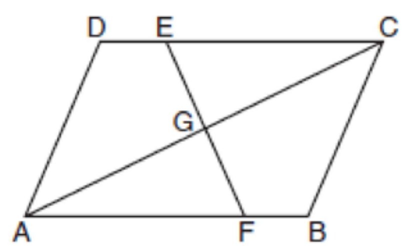
What is the most direct method of proof that could be used to prove $\triangle HIJ \cong \triangle KLJ$?
1) HL ≅ HL
2) SAS ≅ SAS
3) AAS ≅ AAS
4) ASA ≅ ASA

6 In the accompanying diagram, $\overline{CA} \perp \overline{AB}$, $\overline{ED} \perp \overline{DF}$, $\overline{ED} \parallel \overline{AB}$, $\overline{CE} \cong \overline{BF}$, $\overline{AB} \cong \overline{ED}$, and $m\angle CAB = m\angle FDE = 90$.



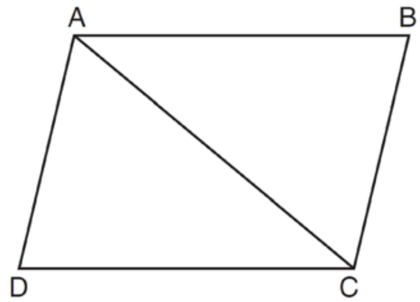
Which statement would *not* be used to prove $\triangle ABC \cong \triangle DEF$?
1) SSS ≅ SSS
2) SAS ≅ SAS
3) AAS ≅ AAS
4) HL ≅ HL

7 In the accompanying diagram of parallelogram *ABCD*, $\overline{DE} \cong \overline{BF}$.



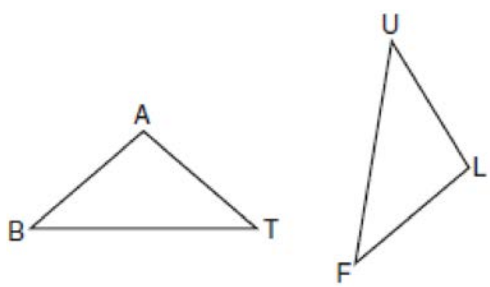
Triangle *EGC* can be proved congruent to triangle *FGA* by
1) HL ≅ HL
2) AAA ≅ AAA
3) AAS ≅ AAS
4) SSA ≅ SSA

8 In the diagram of quadrilateral $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\angle ABC \cong \angle CDA$, and diagonal $\overline{AC}$ is drawn.



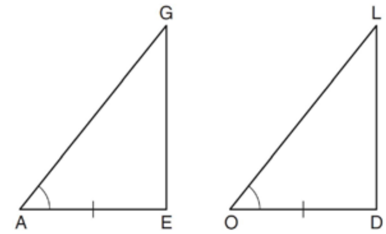
Which method can be used to prove $\triangle ABC$ is congruent to $\triangle CDA$?
1) AAS
2) SSA
3) SAS
4) SSS

9 In the accompanying diagram of triangles BAT and FLU, $\angle B \cong \angle F$ and $\overline{BA} \cong \overline{FL}$.



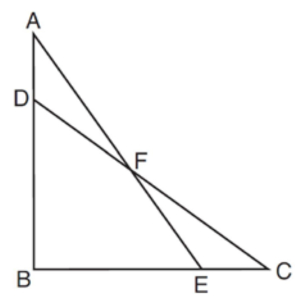
Which statement is needed to prove $\triangle BAT \cong \triangle FLU$?
1) $\angle A \cong \angle L$
2) $\overline{AT} \cong \overline{LU}$
3) $\angle A \cong \angle U$
4) $\overline{BA} \parallel \overline{FL}$

10 In the diagram below of $\triangle AGE$ and $\triangle OLD$, $\angle GAE \cong \angle LOD$, and $\overline{AE} \cong \overline{OD}$.



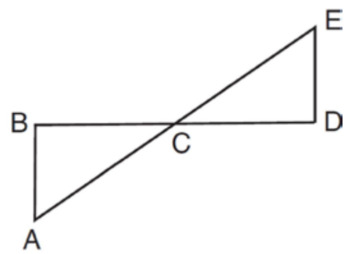
To prove that $\triangle AGE$ and $\triangle OLD$ are congruent by SAS, what other information is needed?
1) $\overline{GE} \cong \overline{LD}$
2) $\overline{AG} \cong \overline{OL}$
3) $\angle AGE \cong \angle OLD$
4) $\angle AEG \cong \angle ODL$

11 Given: $\triangle ABE$ and $\triangle CBD$ shown in the diagram below with $\overline{DB} \cong \overline{BE}$



Which statement is needed to prove $\triangle ABE \cong \triangle CBD$ using only SAS ≅ SAS?
1) $\angle CDB \cong \angle AEB$
2) $\angle AFD \cong \angle EFC$
3) $\overline{AD} \cong \overline{CE}$
4) $\overline{AE} \cong \overline{CD}$

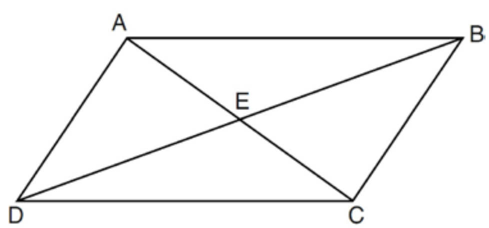
12 Given: $\overline{AE}$ bisects $\overline{BD}$ at C
$\overline{AB}$ and $\overline{DE}$ are drawn
$\angle ABC \cong \angle EDC$



Which statement is needed to prove $\triangle ABC \cong \triangle EDC$ using ASA?

1) $\angle ABC$ and $\angle EDC$ are right angles.
2) $\overline{BD}$ bisects $\overline{AE}$ at C.
3) $\angle BCA \cong \angle DCE$
4) $\angle DEC \cong \angle BAC$

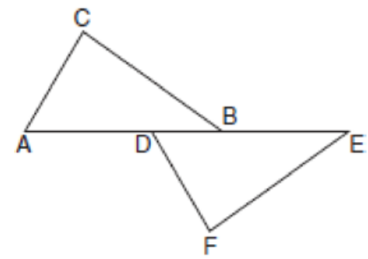
13 In parallelogram $ABCD$ shown below, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E.



Which statement must be true?

1) $\overline{AC} \cong \overline{DB}$
2) $\angle ABD \cong \angle CBD$
3) $\triangle AED \cong \triangle CEB$
4) $\triangle DCE \cong \triangle BCE$

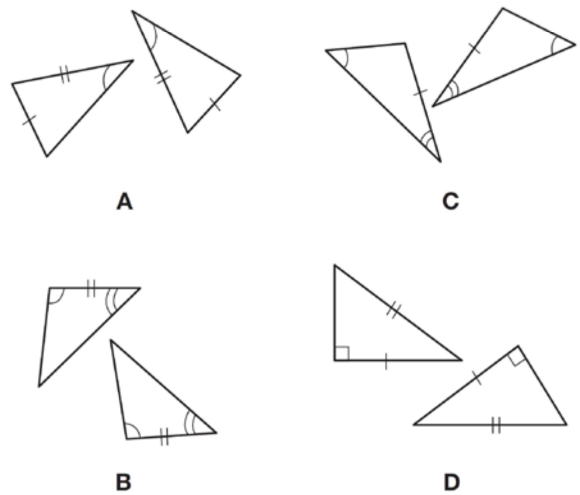
14 Kelly is completing a proof based on the figure below.



She was given that $\angle A \cong \angle EDF$, and has already proven $\overline{AB} \cong \overline{DE}$. Which pair of corresponding parts and triangle congruency method would *not* prove $\triangle ABC \cong \triangle DEF$?

1) $\overline{AC} \cong \overline{DF}$ and SAS
2) $\overline{BC} \cong \overline{EF}$ and SAS
3) $\angle C \cong \angle F$ and AAS
4) $\angle CBA \cong \angle FED$ and ASA

15 In the diagram below, four pairs of triangles are shown. Congruent corresponding parts are labeled in each pair.



Using only the information given in the diagrams, which pair of triangles can *not* be proven congruent?
1) *A*
2) *B*
3) *C*
4) *D*

16 Two right triangles must be congruent if
1) an acute angle in each triangle is congruent
2) the lengths of the hypotenuses are equal
3) the corresponding legs are congruent
4) the areas are equal

17 Which condition does *not* prove that two triangles are congruent?
1) SSS ≅ SSS
2) SSA ≅ SSA
3) SAS ≅ SAS
4) ASA ≅ ASA

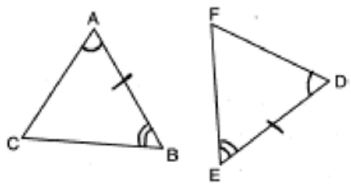
18 The diagonal $\overline{AC}$ is drawn in parallelogram $ABCD$. Which method can *not* be used to prove that $\triangle ABC \cong \triangle CDA$?
1) SSS
2) SAS
3) SSA
4) ASA

19 Which statements could be used to prove that $\triangle ABC$ and $\triangle A'B'C'$ are congruent?
1) $\overline{AB} \cong \overline{A'B'}$, $\overline{BC} \cong \overline{B'C'}$, and $\angle A \cong \angle A'$
2) $\overline{AB} \cong \overline{A'B'}$, $\angle A \cong \angle A'$, and $\angle C \cong \angle C'$
3) $\angle A \cong \angle A'$, $\angle B \cong \angle B'$, and $\angle C \cong \angle C'$
4) $\angle A \cong \angle A'$, $\overline{AC} \cong \overline{A'C'}$, and $\overline{BC} \cong \overline{B'C'}$

20 In $\triangle BAT$ and $\triangle CRE$, $\angle A \cong \angle R$ and $\overline{BA} \cong \overline{CR}$. Write *one* additional statement that could be used to prove that the two triangles are congruent. State the method that would be used to prove that the triangles are congruent.

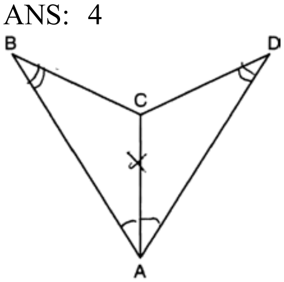
G.SRT.B.5: Triangle Proofs 1
Answer Section

1 ANS: 3



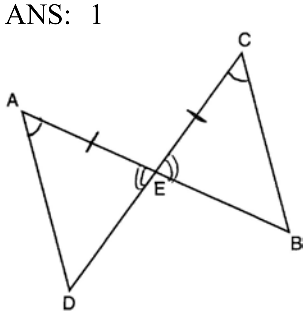
REF: 060902ge

2 ANS: 4



REF: 081114ge

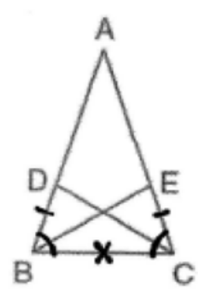
3 ANS: 1



REF: 081210ge

4 ANS: 1

Since $\overline{AB} \cong \overline{AC}$, $\triangle ABC$ is an isosceles triangle and $\angle ABC \cong \angle ACB$.



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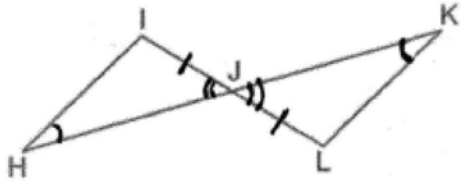
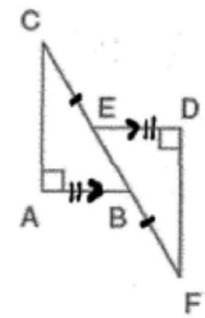
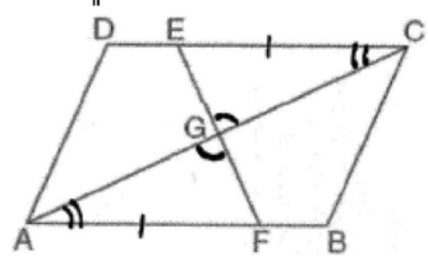
REF: 060204b

5 ANS: 3
Because $\overline{HK}$ bisects $\overline{IL}$, $\overline{JI} \cong \overline{JL}$. $\angle HJI$ and $\angle KJL$ are congruent vertical angles. Since $\angle H \cong \angle K$ is given, AAS ≅ AAS. 

REF: 060420b
6 ANS: 1
Since $\overline{ED} \parallel \overline{AB}$ and $\overline{CEBF}$ is a transversal, $\angle ABC$ and $\angle DEF$ are alternate interior angles and congruent.



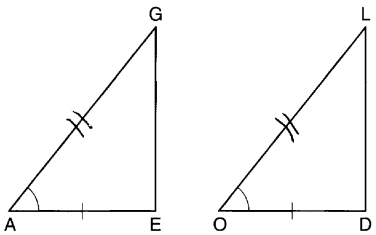
SSS ≅ SSS can not be used because no statement is made that $\overline{AC}$ and $\overline{DF}$ are congruent.

REF: 060320b
7 ANS: 3
$\angle AGF$ and $\angle CGE$ are congruent vertical angles. Because *ABCD* is a parallelogram, $\overline{AB} \cong \overline{CD}$ and since $\overline{DE} \cong \overline{BF}$, $\overline{AF} \cong \overline{CE}$. Because *ABCD* is a parallelogram, $\overline{AB} \parallel \overline{CD}$ and since $\overline{AGC}$ is a transversal, $\angle CAB$ and $\angle ACD$ are alternate interior angles and congruent. 

. This problem can also be solved using elimination. Since they are not right triangles, HL does not apply, AAA only proves similarity and SSA does not prove congruence.

REF: 080310b
8 ANS: 1 REF: 011122ge
9 ANS: 1 REF: 080907b

10 ANS: 2

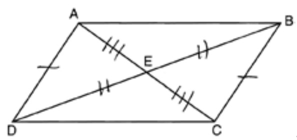


REF: 081007ge

11 ANS: 3 REF: 081622geo

12 ANS: 3 REF: 011627ge

13 ANS: 3



. Opposite sides of a parallelogram are congruent and the diagonals of a parallelogram bisect each other.

REF: 061222ge

14 ANS: 2 REF: 061709geo

15 ANS: 1 REF: 011412ge

16 ANS: 3

1) only proves AA; 2) need congruent legs for HL; 3) SAS; 4) only proves product of altitude and base is equal

REF: 061607geo

17 ANS: 2 REF: 080401b

18 ANS: 3 REF: 080913ge

19 ANS: 2

(2) is AAS, which proves congruency. (1) and (4) are SSA and (3) is AAA.

REF: 010306b

20 ANS:

$\angle B \cong \angle C$ and ASA, or $\angle T \cong \angle E$ and AAS, or $\overline{AT} \cong \overline{RE}$ and SAS

REF: 011022b