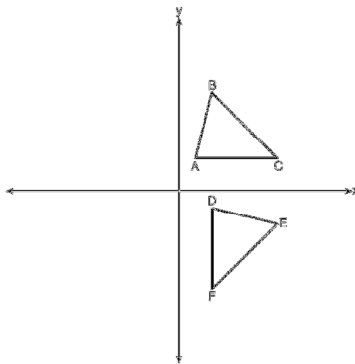


G.CO.6-9 ONLY COMMON CORE QUESTIONS

Multiple Choice

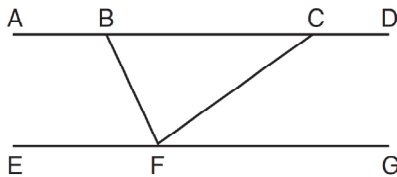
Identify the choice that best completes the statement or answers the question.

- _____ 1 The image of $\triangle ABC$ after a rotation of 90° clockwise about the origin is $\triangle DEF$, as shown below.



Which statement is true?

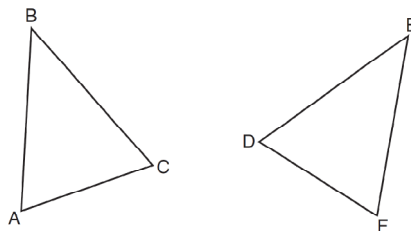
- | | |
|--|------------------------------|
| 1) $\overline{BC} \cong \overline{DE}$ | 3) $\angle C \cong \angle E$ |
| 2) $\overline{AB} \cong \overline{DF}$ | 4) $\angle A \cong \angle D$ |
- _____ 2 Steve drew line segments $ABCD$, EFG , BF , and CF as shown in the diagram below. Scalene $\triangle BFC$ is formed.



Which statement will allow Steve to prove $\overline{ABCD} \parallel \overline{EFG}$?

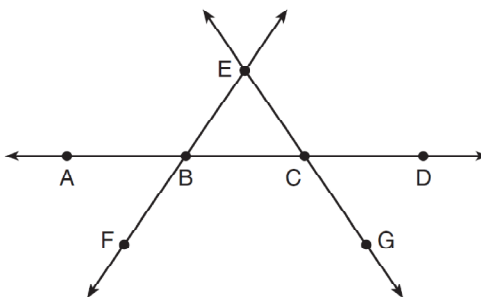
- | | |
|----------------------------------|----------------------------------|
| 1) $\angle CFG \cong \angle FCB$ | 3) $\angle EFB \cong \angle CFB$ |
| 2) $\angle ABF \cong \angle BFC$ | 4) $\angle CBF \cong \angle GFC$ |

_____ 3 Which statement is sufficient evidence that $\triangle DEF$ is congruent to $\triangle ABC$?



- 1) $AB = DE$ and $BC = EF$
- 2) $\angle D \cong \angle A$, $\angle B \cong \angle E$, $\angle C \cong \angle F$
- 3) There is a sequence of rigid motions that maps \overline{AB} onto \overline{DE} , \overline{BC} onto \overline{EF} , and \overline{AC} onto \overline{DF} .
- 4) There is a sequence of rigid motions that maps point A onto point D, \overline{AB} onto \overline{DE} , and $\angle B$ onto $\angle E$.

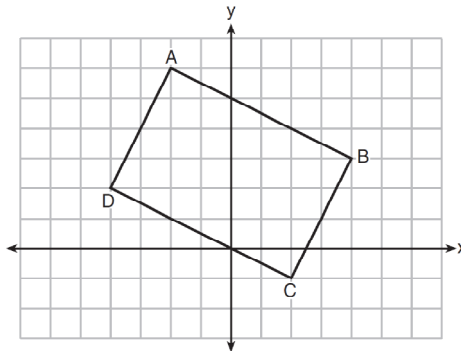
_____ 4 In the diagram below, \overleftrightarrow{FE} bisects \overline{AC} at B, and \overleftrightarrow{GE} bisects \overline{BD} at C.



Which statement is always true?

- 1) $\overline{AB} \cong \overline{DC}$
- 2) $\overline{FB} \cong \overline{EB}$
- 3) \overleftrightarrow{BD} bisects \overline{GE} at C.
- 4) \overleftrightarrow{AC} bisects \overline{FE} at B.

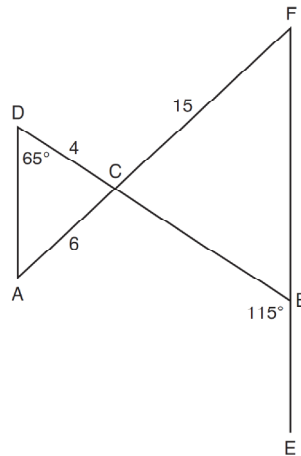
_____ 5 Quadrilateral $ABCD$ is graphed on the set of axes below.



When $ABCD$ is rotated 90° in a counterclockwise direction about the origin, its image is quadrilateral $A'B'C'D'$. Is distance preserved under this rotation, and which coordinates are correct for the given vertex?

- | | |
|---------------------|-----------------------|
| 1) no and $C'(1,2)$ | 3) yes and $A'(6,2)$ |
| 2) no and $D'(2,4)$ | 4) yes and $B'(-3,4)$ |

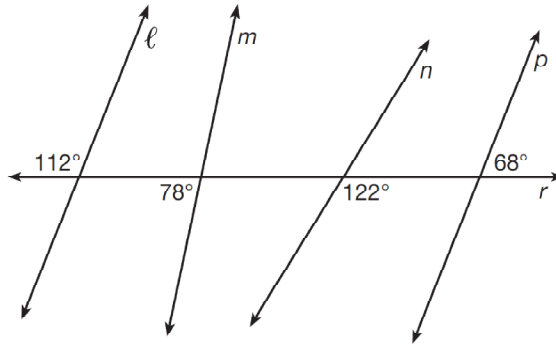
_____ 6 In the diagram below, \overline{DB} and \overline{AF} intersect at point C , and \overline{AD} and \overline{FBE} are drawn.



If $AC = 6$, $DC = 4$, $FC = 15$, $m\angle D = 65^\circ$, and $m\angle CBE = 115^\circ$, what is the length of \overline{CB} ?

- | | |
|-------|---------|
| 1) 10 | 3) 17 |
| 2) 12 | 4) 22.5 |

7 In the diagram below, lines ℓ , m , n , and p intersect line r .



Which statement is true?

- 1) $\ell \parallel n$
- 2) $\ell \parallel p$
- 3) $m \parallel p$
- 4) $m \parallel n$

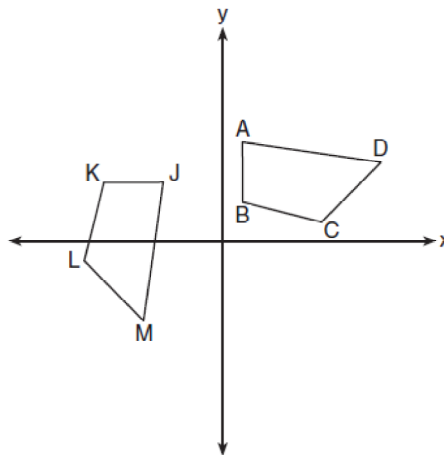
8 Segment CD is the perpendicular bisector of \overline{AB} at E . Which pair of segments does *not* have to be congruent?

- 1) $\overline{AD}, \overline{BD}$
- 2) $\overline{AC}, \overline{BC}$
- 3) $\overline{AE}, \overline{BE}$
- 4) $\overline{DE}, \overline{CE}$

9 In the two distinct acute triangles ABC and DEF , $\angle B \cong \angle E$. Triangles ABC and DEF are congruent when there is a sequence of rigid motions that maps

- 1) $\angle A$ onto $\angle D$, and $\angle C$ onto $\angle F$
- 2) \overline{AC} onto \overline{DF} , and \overline{BC} onto \overline{EF}
- 3) $\angle C$ onto $\angle F$, and \overline{BC} onto \overline{EF}
- 4) point A onto point D , and \overline{AB} onto \overline{DE}

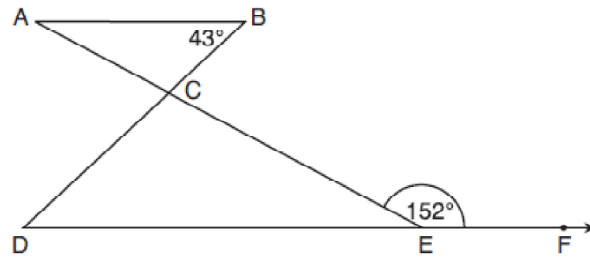
10 In the diagram below, a sequence of rigid motions maps $ABCD$ onto $JKLM$.



If $m\angle A = 82^\circ$, $m\angle B = 104^\circ$, and $m\angle L = 121^\circ$, the measure of $\angle M$ is

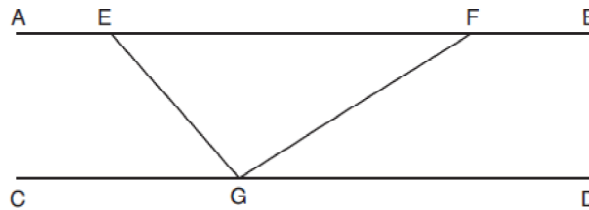
- 1) 53°
- 2) 82°
- 3) 104°
- 4) 121°

- _____ 13 In the diagram below, $\overline{AB} \parallel \overline{DEF}$, \overline{AE} and \overline{BD} intersect at C , $m\angle B = 43^\circ$, and $m\angle CEF = 152^\circ$.



Which statement is true?

- _____ 14 In the diagram below, $\overline{AEFB} \parallel \overline{CGD}$, and \overline{GE} and \overline{GF} are drawn.

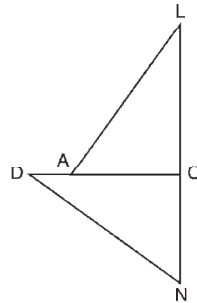


If $m\angle EFG = 32^\circ$ and $m\angle AEG = 137^\circ$, what is $m\angle EGF$?

- _____ 15 If $\triangle ABC$ is mapped onto $\triangle DEF$ after a line reflection and $\triangle DEF$ is mapped onto $\triangle XYZ$ after a translation, the relationship between $\triangle ABC$ and $\triangle XYZ$ is that they are always

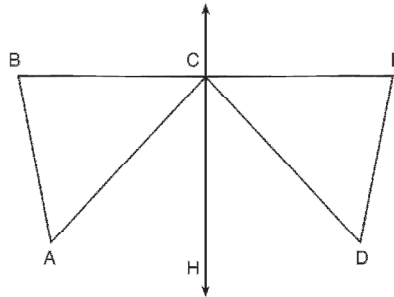
Short Answer

16 In the diagram of $\triangle LAC$ and $\triangle DNC$ below, $\overline{LA} \cong \overline{DN}$, $\overline{CA} \cong \overline{CN}$, and $\overline{DAC} \perp \overline{LCN}$.

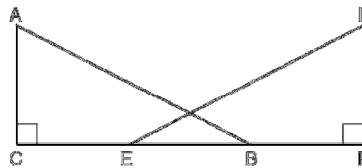


- a) Prove that $\triangle LAC \cong \triangle DNC$.
- b) Describe a sequence of rigid motions that will map $\triangle LAC$ onto $\triangle DNC$.

17 Given: D is the image of A after a reflection over \overleftrightarrow{CH} .
 \overleftrightarrow{CH} is the perpendicular bisector of \overline{BE}
 $\triangle ABC$ and $\triangle DEC$ are drawn
 Prove: $\triangle ABC \cong \triangle DEC$

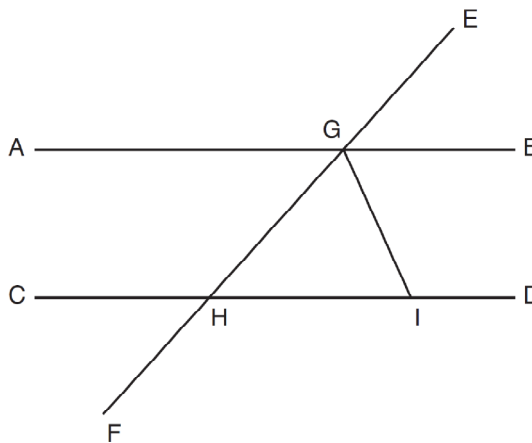


18 Given right triangles ABC and DEF where $\angle C$ and $\angle F$ are right angles, $\overline{AC} \cong \overline{DF}$ and $\overline{CB} \cong \overline{FE}$. Describe a precise sequence of rigid motions which would show $\triangle ABC \cong \triangle DEF$.



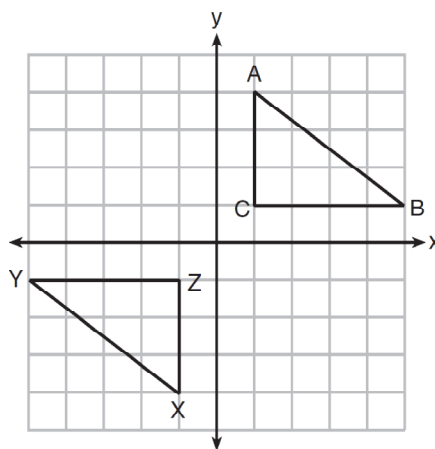
19 After a reflection over a line, $\triangle A'B'C'$ is the image of $\triangle ABC$. Explain why triangle ABC is congruent to triangle $\triangle A'B'C'$.

- 20 In the diagram below, \overline{EF} intersects \overline{AB} and \overline{CD} at G and H , respectively, and \overline{GI} is drawn such that $\overline{GH} \cong \overline{IH}$.



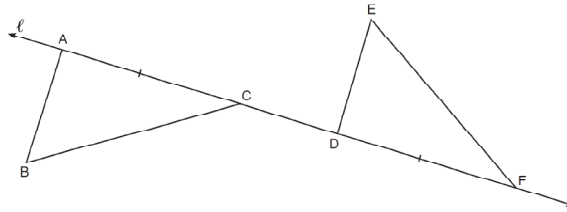
If $m\angle EGB = 50^\circ$ and $m\angle DIG = 115^\circ$, explain why $\overline{AB} \parallel \overline{CD}$.

- 21 In the diagram below, $\triangle ABC$ and $\triangle XYZ$ are graphed.



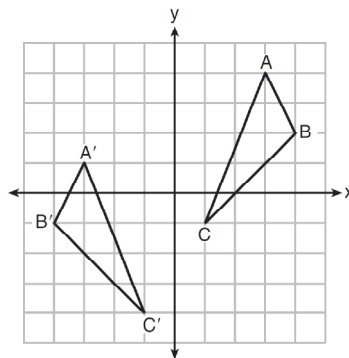
Use the properties of rigid motions to explain why $\triangle ABC \cong \triangle XYZ$.

- 22 In the diagram below, $\overline{AC} \cong \overline{DF}$ and points A , C , D , and F are collinear on line ℓ .



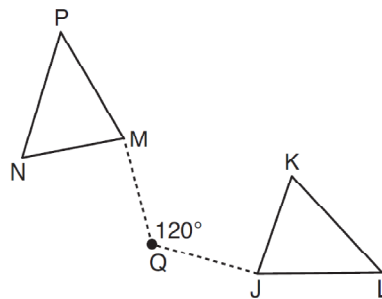
Let $\triangle D'E'F'$ be the image of $\triangle DEF$ after a translation along ℓ , such that point D is mapped onto point A . Determine and state the location of F' . Explain your answer. Let $\triangle D''E''F''$ be the image of $\triangle D'E'F'$ after a reflection across line ℓ . Suppose that E'' is located at B . Is $\triangle DEF$ congruent to $\triangle ABC$? Explain your answer.

- 23 As graphed on the set of axes below, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a sequence of transformations.

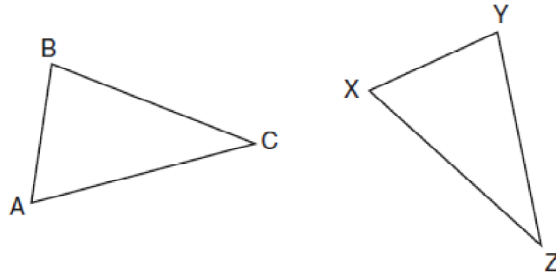


Is $\triangle A'B'C'$ congruent to $\triangle ABC$? Use the properties of rigid motion to explain your answer.

- 24 Triangle MNP is the image of triangle JKL after a 120° counterclockwise rotation about point Q . If the measure of angle L is 47° and the measure of angle N is 57° , determine the measure of angle M . Explain how you arrived at your answer.

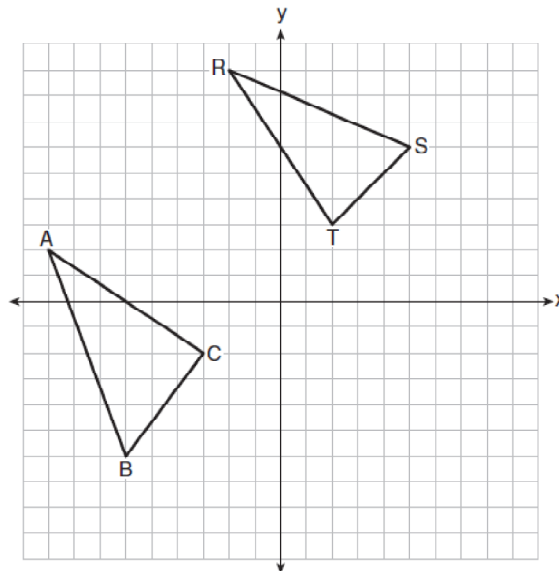


- 25 In the diagram below of $\triangle ABC$ and $\triangle XYZ$, a sequence of rigid motions maps $\angle A$ onto $\angle X$, $\angle C$ onto $\angle Z$, and \overline{AC} onto \overline{XZ} .



Determine and state whether $\overline{BC} \cong \overline{YZ}$. Explain why.

- 26 In the graph below, $\triangle ABC$ has coordinates $A(-9,2)$, $B(-6,-6)$, and $C(-3,-2)$, and $\triangle RST$ has coordinates $R(-2,9)$, $S(5,6)$, and $T(2,3)$.



Is $\triangle ABC$ congruent to $\triangle RST$? Use the properties of rigid motions to explain your reasoning.

- 27 Triangle $A'B'C'$ is the image of triangle ABC after a translation of 2 units to the right and 3 units up. Is triangle ABC congruent to triangle $A'B'C'$? Explain why.

G.CO.6-9 ONLY COMMON CORE QUESTIONS

Answer Section

MULTIPLE CHOICE

- | | | |
|----|--------|--------|
| 1 | ANS: 4 | PTS: 2 |
| 2 | ANS: 1 | PTS: 2 |
| 3 | ANS: 3 | PTS: 2 |
| 4 | ANS: 1 | PTS: 2 |
| 5 | ANS: 4 | PTS: 2 |
| 6 | ANS: 1 | PTS: 2 |
| 7 | ANS: 2 | PTS: 2 |
| 8 | ANS: 4 | PTS: 2 |
| 9 | ANS: 3 | PTS: 2 |
| 10 | ANS: 1 | PTS: 2 |
| 11 | ANS: 2 | PTS: 2 |
| 12 | ANS: 1 | PTS: 2 |
| 13 | ANS: 3 | PTS: 2 |
| 14 | ANS: 4 | PTS: 2 |
| 15 | ANS: 1 | PTS: 2 |

SHORT ANSWER

- 16 ANS: $\overline{LA} \cong \overline{DN}$, $\overline{CA} \cong \overline{CN}$, and $\overline{DAC} \perp \overline{LCN}$ (Given). $\angle LCA$ and $\angle DCN$ are right angles (Definition of perpendicular lines). $\triangle LAC$ and $\triangle DNC$ are right triangles (Definition of a right triangle). $\triangle LAC \cong \triangle DNC$ (HL). $\triangle LAC$ will map onto $\triangle DNC$ after rotating $\triangle LAC$ counterclockwise 90° about point C such that point L maps onto point D .
- PTS: 4
- 17 ANS:
- It is given that point D is the image of point A after a reflection in line CH . It is given that \overleftrightarrow{CH} is the perpendicular bisector of \overline{BCE} at point C . Since a bisector divides a segment into two congruent segments at its midpoint, $\overline{BC} \cong \overline{EC}$. Point E is the image of point B after a reflection over the line CH , since points B and E are equidistant from point C and it is given that \overleftrightarrow{CH} is perpendicular to \overline{BE} . Point C is on \overleftrightarrow{CH} , and therefore, point C maps to itself after the reflection over \overleftrightarrow{CH} . Since all three vertices of triangle ABC map to all three vertices of triangle DEC under the same line reflection, then $\triangle ABC \cong \triangle DEC$ because a line reflection is a rigid motion and triangles are congruent when one can be mapped onto the other using a sequence of rigid motions.
- PTS: 6

18 ANS:

Translate $\triangle ABC$ along \overline{CF} such that point C maps onto point F , resulting in image $\triangle A'B'C'$. Then reflect $\triangle A'B'C'$ over \overline{DF} such that $\triangle A'B'C'$ maps onto $\triangle DEF$.

or

Reflect $\triangle ABC$ over the perpendicular bisector of \overline{EB} such that $\triangle ABC$ maps onto $\triangle DEF$.

PTS: 2

19 ANS:

Reflections are rigid motions that preserve distance.

PTS: 2

20 ANS:

Since linear angles are supplementary, $m\angle GIH = 65^\circ$. Since $\overline{GH} \cong \overline{IH}$, $m\angle GHI = 50^\circ$ ($180 - (65 + 65)$). Since $\angle EGB \cong \angle GHI$, the corresponding angles formed by the transversal and lines are congruent and $\overline{AB} \parallel \overline{CD}$.

PTS: 4

21 ANS:

The transformation is a rotation, which is a rigid motion.

PTS: 2

22 ANS:

Translations preserve distance. If point D is mapped onto point A , point F would map onto point C . $\triangle DEF \cong \triangle ABC$ as $\overline{AC} \cong \overline{DF}$ and points are collinear on line ℓ and a reflection preserves distance.

PTS: 4

23 ANS:

Yes. The sequence of transformations consists of a reflection and a translation, which are isometries which preserve distance and congruency.

PTS: 2

24 ANS:

$M = 180 - (47 + 57) = 76$ Rotations do not change angle measurements.

PTS: 2

25 ANS:

Yes. $\angle A \cong \angle X$, $\angle C \cong \angle Z$, $\overline{AC} \cong \overline{XZ}$ after a sequence of rigid motions which preserve distance and angle measure, so $\triangle ABC \cong \triangle XYZ$ by ASA. $\overline{BC} \cong \overline{YZ}$ by CPCTC.

PTS: 2

26 ANS:

No. Since $\overline{BC} = 5$ and $\overline{ST} = \sqrt{18}$ are not congruent, the two triangles are not congruent. Since rigid motions preserve distance, there is no rigid motion that maps $\triangle ABC$ onto $\triangle RST$.

PTS: 2

27 ANS:
Yes, as translations do not change angle measurements.

PTS: 2