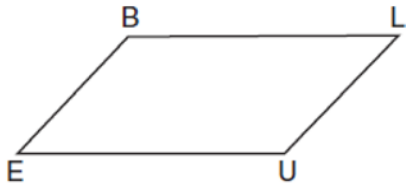
G.CO.C.11: Parallelograms 1

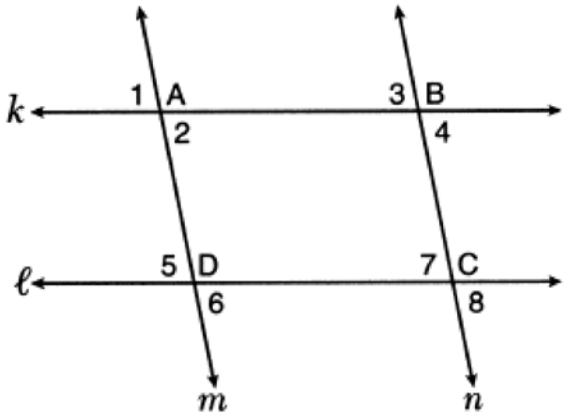
1 In quadrilateral *BLUE* shown below, $\overline{BE} \cong \overline{UL}$.



Which information would be sufficient to prove quadrilateral *BLUE* is a parallelogram?

1) $\overline{BL} \parallel \overline{EU}$
2) $\overline{LU} \parallel \overline{BE}$
3) $\overline{BE} \cong \overline{BL}$
4) $\overline{LU} \cong \overline{EU}$

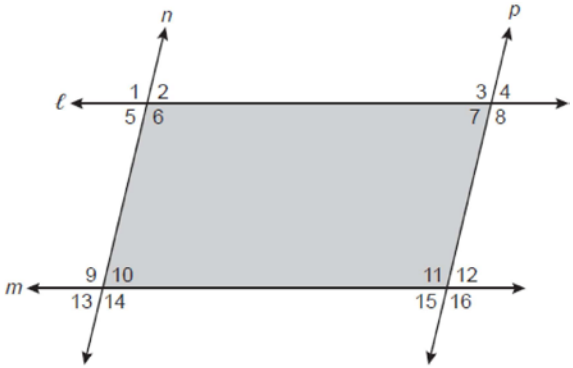
2 In the diagram below, lines k and ℓ intersect lines m and n at points A, B, C, and D.



Which statement is sufficient to prove *ABCD* is a parallelogram?

1) $\angle 1 \cong \angle 3$
2) $\angle 4 \cong \angle 7$
3) $\angle 2 \cong \angle 5$ and $\angle 5 \cong \angle 7$
4) $\angle 1 \cong \angle 3$ and $\angle 3 \cong \angle 4$

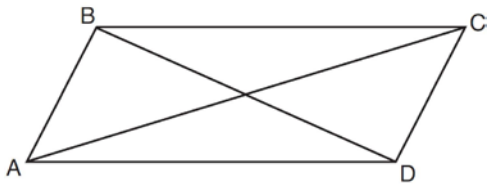
3 In the diagram below, lines ℓ and m intersect lines n and p to create the shaded quadrilateral as shown.



Which congruence statement would be sufficient to prove the quadrilateral is a parallelogram?

1) $\angle 1 \cong \angle 6$ and $\angle 9 \cong \angle 14$
2) $\angle 5 \cong \angle 10$ and $\angle 6 \cong \angle 9$
3) $\angle 5 \cong \angle 7$ and $\angle 10 \cong \angle 15$
4) $\angle 6 \cong \angle 9$ and $\angle 9 \cong \angle 11$

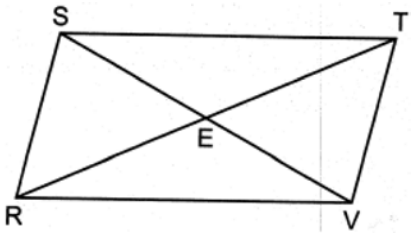
4 Quadrilateral *ABCD* with diagonals $\overline{AC}$ and $\overline{BD}$ is shown in the diagram below.



Which information is *not* enough to prove *ABCD* is a parallelogram?

1) $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{DC}$
2) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$
3) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$
4) $\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \parallel \overline{AD}$

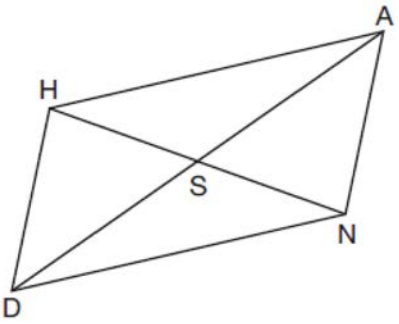
5 In the diagram below of parallelogram *RSTV*, diagonals $\overline{SV}$ and $\overline{RT}$ intersect at *E*.



Which statement is always true?

1) $\overline{SR} \cong \overline{RV}$
2) $\overline{RT} \cong \overline{SV}$
3) $\overline{SE} \cong \overline{RE}$
4) $\overline{RE} \cong \overline{TE}$

6 Parallelogram *HAND* is drawn below with diagonals $\overline{HN}$ and $\overline{AD}$ intersecting at *S*.



Which statement is always true?

1) $AN = \frac{1}{2}AD$
2) $AS = \frac{1}{2}AD$
3) $\angle AHS \cong \angle ANS$
4) $\angle HDS \cong \angle NDS$

7 Which statement about parallelograms is always true?

1) The diagonals are congruent.
2) The diagonals bisect each other.
3) The diagonals are perpendicular.
4) The diagonals bisect their respective angles.

8 A quadrilateral must be a parallelogram if

1) one pair of sides is parallel and one pair of angles is congruent
2) one pair of sides is congruent and one pair of angles is congruent
3) one pair of sides is both parallel and congruent
4) the diagonals are congruent

9 Quadrilateral *ABCD* has diagonals $\overline{AC}$ and $\overline{BD}$. Which information is *not* sufficient to prove *ABCD* is a parallelogram?

1) $\overline{AC}$ and $\overline{BD}$ bisect each other.
2) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{AD}$
3) $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{CD}$
4) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$

10 Quadrilateral *BEST* has diagonals that intersect at point *D*. Which statement would *not* be sufficient to prove quadrilateral *BEST* is a parallelogram?

1) $\overline{BD} \cong \overline{SD}$ and $\overline{ED} \cong \overline{TD}$
2) $\overline{BE} \cong \overline{ST}$ and $\overline{ES} \cong \overline{TB}$
3) $\overline{ES} \cong \overline{TB}$ and $\overline{BE} \parallel \overline{TS}$
4) $\overline{ES} \parallel \overline{BT}$ and $\overline{BE} \parallel \overline{TS}$

11 In quadrilateral *QRST*, diagonals $\overline{QS}$ and $\overline{RT}$ intersect at *M*. Which statement would always prove quadrilateral *QRST* is a parallelogram?

1) $\angle TQR$ and $\angle QRS$ are supplementary.
2) $\overline{QM} \cong \overline{SM}$ and $\overline{QT} \cong \overline{RS}$
3) $\overline{QR} \cong \overline{TS}$ and $\overline{QT} \cong \overline{RS}$
4) $\overline{QR} \cong \overline{TS}$ and $\overline{QT} \parallel \overline{RS}$

12 Quadrilateral *MATH* has both pairs of opposite sides congruent and parallel. Which statement about quadrilateral *MATH* is always true?

1) $\overline{MT} \cong \overline{AH}$
2) $\overline{MT} \perp \overline{AH}$
3) $\angle MHT \cong \angle ATH$
4) $\angle MAT \cong \angle MHT$

13 In parallelogram *ABCD* with $\overline{AC} \perp \overline{BD}$, $AC = 12$ and $BD = 16$. What is the perimeter of *ABCD*?

1) 10
2) 24
3) 40
4) 56

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Answer Section

1 ANS: 2 REF: 061720geo

2 ANS: 3
Therefore $\angle 2 \cong \angle 7$. Since opposite angles are congruent, *ABCD* is a parallelogram.

REF: 062209geo

3 ANS: 4
$\angle 6$ and $\angle 9$ are alternate interior angles; since congruent, $\ell \parallel m$. $\angle 9$ and $\angle 11$ are corresponding angles; since congruent, $n \parallel p$. Both pairs of opposite sides are parallel.

REF: 082319geo

4 ANS: 3
(3) Could be a trapezoid.

REF: 081607geo

5 ANS: 4 REF: 082404geo

6 ANS: 2 REF: 011802geo

7 ANS: 2 REF: 011912geo

8 ANS: 3 REF: 061912geo

9 ANS: 4 REF: 061513geo

10 ANS: 3
3) Could be an isosceles trapezoid.

REF: 012318geo

11 ANS: 3 REF: 081913geo

12 ANS: 4 REF: 081813geo

13 ANS: 3
The half diagonals have lengths of 6 and 8, so each side of *ABCD* is 10.

REF: 012417geo