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G.CO.C.11: Special Quadrilaterals 1

1 In the diagram below of square CASH, diagonals \overline{AH} and \overline{CS} intersect at Z.



Which statement is true?

- 1) $m\angle ACZ > m\angle ZCH$
- 2) $m \angle ACZ < m \angle ASZ$
- 3) $m\angle AZC = m\angle SHC$
- 4) $m \angle AZC = m \angle ZCH$
- 2 Which information is *not* sufficient to prove that a parallelogram is a square?
 - 1) The diagonals are both congruent and perpendicular.
 - 2) The diagonals are congruent and one pair of adjacent sides are congruent.
 - 3) The diagonals are perpendicular and one pair of adjacent sides are congruent.
 - 4) The diagonals are perpendicular and one pair of adjacent sides are perpendicular.

3 Parallelogram *BETH*, with diagonals \overline{BT} and \overline{HE} , is drawn below.



What additional information is sufficient to prove that *BETH* is a rectangle?

1) $\overline{BT} \perp \overline{HE}$

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- 2) $\overline{BE} \parallel \overline{HT}$
- 3) $\overline{BT} \cong \overline{HE}$
- 4) $\overline{BE} \cong \overline{ET}$
- 4 If *ABCD* is a parallelogram, which additional information is sufficient to prove that *ABCD* is a rectangle?
 - 1) $\overline{AB} \cong \overline{BC}$
 - 2) $\overline{AB} \parallel \overline{CD}$
 - 3) $\overline{AC} \cong \overline{BD}$
 - 4) $\overline{AC} \perp \overline{BD}$
- 5 In parallelogram *ABCD*, diagonals \overline{AC} and \overline{BD} intersect at *E*. Which statement proves *ABCD* is a rectangle?
 - 1) $\overline{AC} \cong \overline{BD}$
 - 2) $\overline{AB} \perp \overline{BD}$
 - 3) $\overline{AC} \perp \overline{BD}$
 - 4) \overline{AC} bisects $\angle BCD$
- 6 A parallelogram must be a rectangle when its
 - 1) diagonals are perpendicular
 - 2) diagonals are congruent
 - 3) opposite sides are parallel
 - 4) opposite sides are congruent

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- 7 A parallelogram is always a rectangle if
 - 1) the diagonals are congruent
 - 2) the diagonals bisect each other
 - 3) the diagonals intersect at right angles
 - 4) the opposite angles are congruent
- 8 The diagram below shows parallelogram ABCDwith diagonals \overline{AC} and \overline{BD} intersecting at E.



What additional information is sufficient to prove that parallelogram *ABCD* is also a rhombus?

- 1) \overline{BD} bisects \overline{AC} .
- 2) \overline{AB} is parallel to \overline{CD} .
- 3) \overline{AC} is congruent to \overline{BD} .
- 4) \overline{AC} is perpendicular to \overline{BD} .
- 9 Parallelogram *EATK* has diagonals \overline{ET} and \overline{AK} . Which information is always sufficient to prove *EATK* is a rhombus?
 - 1) $\overline{EA} \perp \overline{AT}$
 - 2) $\overline{EA} \cong \overline{AT}$
 - 3) $\overline{ET} \cong \overline{AK}$
 - 4) $\overline{ET} \cong \overline{AT}$
- 10 Which congruence statement is sufficient to prove parallelogram *MARK* is a rhombus?
 - 1) $\overline{MA} \cong \overline{MK}$
 - 2) $\overline{MA} \cong \overline{KR}$
 - 3) $\angle K \cong \angle A$
 - 4) $\angle R \cong \angle A$

- 11 In parallelogram *ABCD*, diagonals *AC* and *BD* intersect at *E*. Which statement does *not* prove parallelogram *ABCD* is a rhombus?
 - 1) $\overline{AC} \cong \overline{DB}$
 - 2) $\overline{AB} \cong \overline{BC}$
 - 3) $\overline{AC} \perp \overline{DB}$
 - 4) \overline{AC} bisects $\angle DCB$
- 12 If *ABCD* is a parallelogram, which statement would prove that *ABCD* is a rhombus?
 - 1) $\angle ABC \cong \angle CDA$
 - 2) $\overline{AC} \cong \overline{BD}$
 - 3) $\overline{AC} \perp \overline{BD}$
 - 4) $\overline{AB} \perp \overline{CD}$
- 13 A parallelogram must be a rhombus if its diagonals
 - 1) are congruent
 - 2) bisect each other
 - 3) do not bisect its angles
 - 4) are perpendicular to each other
- 14 In quadrilateral *TOWN*, $\overline{OW} \cong \overline{TN}$ and $\overline{OT} \cong \overline{WN}$. Which additional information is sufficient to prove quadrilateral *TOWN* is a rhombus?
 - 1) $\overline{ON} \perp \overline{TW}$
 - 2) $\overline{TO} \perp \overline{OW}$
 - 3) $\overline{OW} \parallel \overline{TN}$
 - 4) \overline{ON} and \overline{TW} bisect each other.
- 15 Which set of statements would describe a parallelogram that can always be classified as a rhombus?

I. Diagonals are perpendicular bisectors of each other.

II. Diagonals bisect the angles from which they are drawn.

III. Diagonals form four congruent isosceles right triangles.

- 1) I and II
- 2) I and III
- 3) II and III
- 4) I, II, and III

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16 In rhombus *TIGE*, diagonals \overline{TG} and \overline{IE} intersect at *R*. The perimeter of *TIGE* is 68, and TG = 16.



What is the length of diagonal \overline{IE} ?

- 1) 15
- 2) 30
- 3) 34
- 4) 52
- 17 In rhombus *VENU*, diagonals \overline{VN} and \overline{EU} intersect at *S*. If VN = 12 and EU = 16, what is the perimeter of the rhombus?
 - 1) 80
 - 2) 40
 - 3) 20
 - 4) 10
- 18 In the diagram of rhombus *PQRS* below, the diagonals \overline{PR} and \overline{QS} intersect at point *T*, PR = 16, and QS = 30. Determine and state the perimeter of *PQRS*.



19 In the diagram below, if $\triangle ABE \cong \triangle CDF$ and \overline{AEFC} is drawn, then it could be proven that quadrilateral ABCD is a



- 1) square
- 2) rhombus
- 3) rectangle
- 4) parallelogram
- 20 A quadrilateral has diagonals that are perpendicular but *not* congruent. This quadrilateral could be
 - 1) a square
 - 2) a rhombus
 - 3) a rectangle
 - 4) an isosceles trapezoid
- 21 Which polygon does *not* always have congruent diagonals?
 - 1) square
 - 2) rectangle
 - 3) rhombus
 - 4) isosceles trapezoid
- 22 Which quadrilateral has diagonals that are always perpendicular?
 - 1) rectangle
 - 2) rhombus
 - 3) trapezoid
 - 4) parallelogram

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1	ANS:	3	REF:	012413geo
2	ANS:	3	REF:	061924geo
3	ANS:	3	REF:	062310geo
4	ANS:	3	REF:	062417geo
5	ANS:	1	REF:	012004geo
6	ANS:	2	REF:	081501geo
7	ANS:	1	REF:	011716geo
8	ANS:	4	REF:	061813geo
9	ANS:	2	REF:	012420geo
10	ANS:	1	REF:	062423geo
11	ANS:	1		

1) opposite sides; 2) adjacent sides; 3) perpendicular diagonals; 4) diagonal bisects angle

REF: 061609geo

12 ANS: 3

In (1) and (2), ABCD could be a rectangle with non-congruent sides. (4) is not possible

REF: 081714geo

13	ANS:	4	REF:	011819geo
14	ANS:	1	REF:	012524geo

- 15 ANS: 4 REF: 061711geo
- 16 ANS: 2_____

$$ER = \sqrt{17^2 - 8^2} = 15$$

REF: 061917geo

17 ANS: 2
$$\sqrt{8^2 + 6^2} = 10$$
 for one side

REF: 011907geo

18 ANS:

The four small triangles are 8-15-17 triangles. $4 \times 17 = 68$

REF: 081726geo

19	ANS:	4	REF:	011705geo
20	ANS:	2	REF:	082204geo
21	ANS:	3	REF:	012309geo
22	ANS:	2	REF:	082305geo