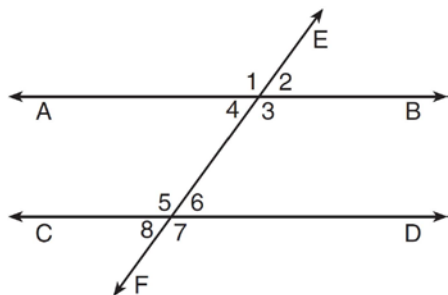


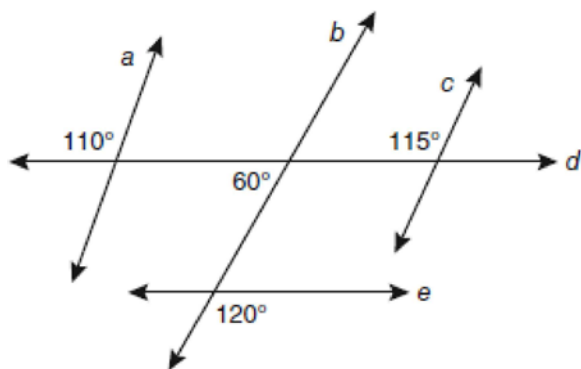
G.G.35: Parallel Lines and Transversals 1: Determine if two lines cut by a transversal are parallel based on the measure of given pairs of angles formed by the transversal/lines

- 1 Transversal \overleftrightarrow{EF} intersects \overleftrightarrow{AB} and \overleftrightarrow{CD} , as shown in the diagram below.



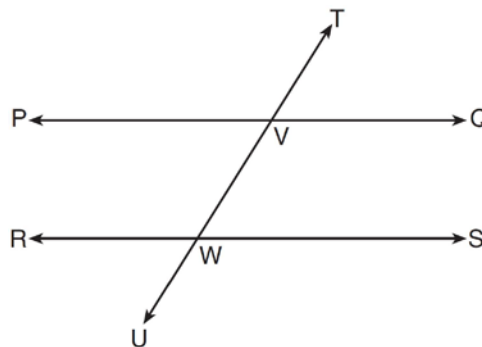
Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?

- 1) $\angle 2 \cong \angle 4$
 - 2) $\angle 7 \cong \angle 8$
 - 3) $\angle 3$ and $\angle 6$ are supplementary
 - 4) $\angle 1$ and $\angle 5$ are supplementary
- 2 A transversal intersects two lines. Which condition would always make the two lines parallel?
- 1) Vertical angles are congruent.
 - 2) Alternate interior angles are congruent.
 - 3) Corresponding angles are supplementary.
 - 4) Same-side interior angles are complementary.
- 3 Based on the diagram below, which statement is true?



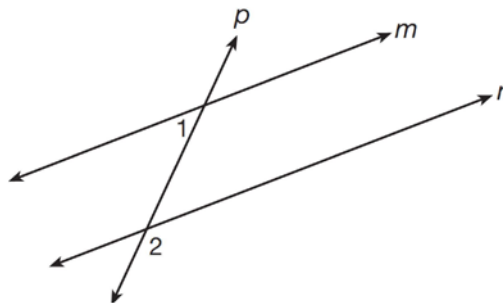
- 1) $a \parallel b$
- 2) $a \parallel c$
- 3) $b \parallel c$
- 4) $d \parallel e$

- 4 In the diagram below, transversal \overleftrightarrow{TU} intersects \overleftrightarrow{PQ} and \overleftrightarrow{RS} at V and W , respectively.



If $m\angle TVQ = 5x - 22$ and $m\angle VWS = 3x + 10$, for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$?

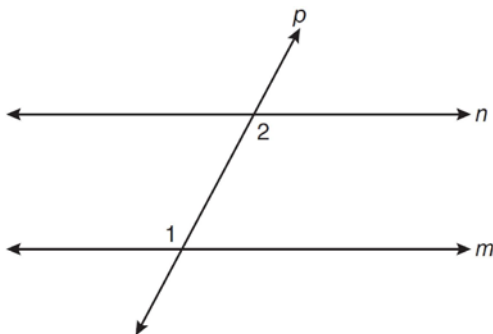
- 1) 6
 - 2) 16
 - 3) 24
 - 4) 28
- 5 As shown in the diagram below, lines m and n are cut by transversal p .



If $m\angle 1 = 4x + 14$ and $m\angle 2 = 8x + 10$, lines m and n are parallel when x equals

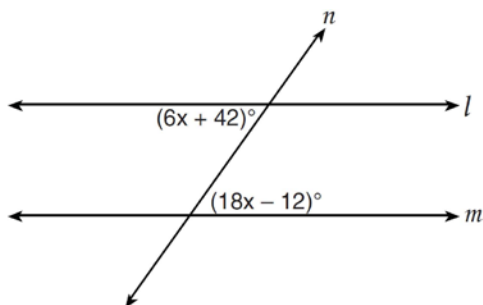
- 1) 1
- 2) 6
- 3) 13
- 4) 17

- 6 In the diagram below, line p intersects line m and line n .



If $m\angle 1 = 7x$ and $m\angle 2 = 5x + 30$, lines m and n are parallel when x equals

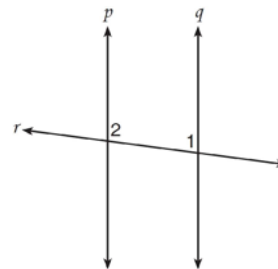
- 1) 12.5
 - 2) 15
 - 3) 87.5
 - 4) 105
- 7 Line n intersects lines l and m , forming the angles shown in the diagram below.



Which value of x would prove $l \parallel m$?

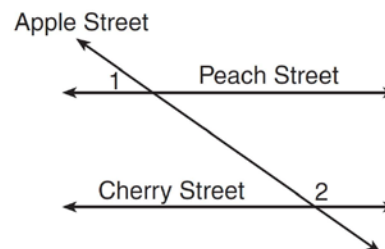
- 1) 2.5
- 2) 4.5
- 3) 6.25
- 4) 8.75

- 8 Lines p and q are intersected by line r , as shown below.



If $m\angle 1 = 7x - 36$ and $m\angle 2 = 5x + 12$, for which value of x would $p \parallel q$?

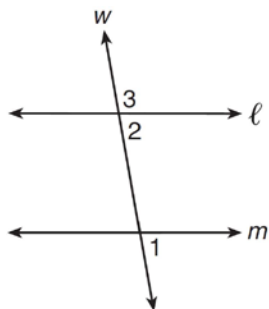
- 1) 17
 - 2) 24
 - 3) 83
 - 4) 97
- 9 Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.



If $m\angle 1 = 2x + 36$ and $m\angle 2 = 7x - 9$, what is $m\angle 1$?

- 1) 9
- 2) 17
- 3) 54
- 4) 70

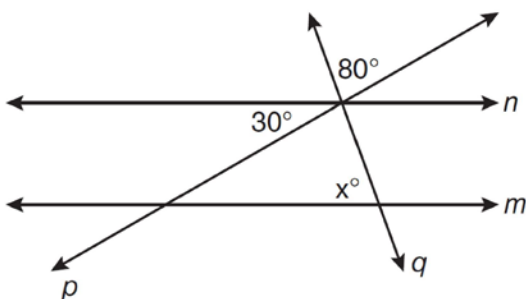
- 10 In the diagram below, line ℓ is parallel to line m , and line w is a transversal.



(Not drawn to scale)

If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?

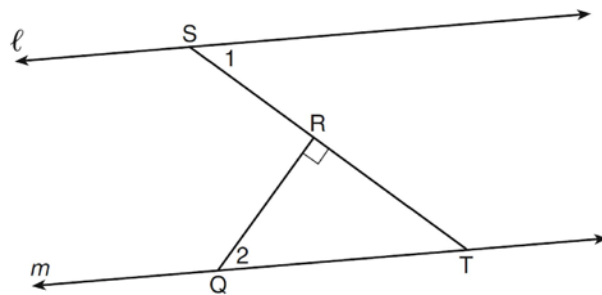
- 1) 19
 - 2) 23
 - 3) 74
 - 4) 86
- 11 In the diagram below, lines n and m are cut by transversals p and q .



What value of x would make lines n and m parallel?

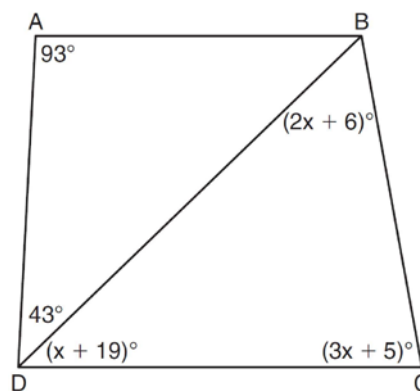
- 1) 110
- 2) 80
- 3) 70
- 4) 50

- 12 In the diagram below, $\ell \parallel m$ and $\overline{QR} \perp \overline{ST}$ at R .



If $m\angle 1 = 63$, find $m\angle 2$.

- 13 In the diagram below of quadrilateral $ABCD$ with diagonal \overline{BD} , $m\angle A = 93$, $m\angle ADB = 43$, $m\angle C = 3x + 5$, $m\angle BDC = x + 19$, and $m\angle DBC = 2x + 6$. Determine if \overline{AB} is parallel to \overline{DC} . Explain your reasoning.



G.G.35: Parallel Lines and Transversals 1: Determine if two lines cut by a transversal are parallel based on the measure of given pairs of angles formed by the transversal/lines
Answer Section

1 ANS: 3 REF: 061320ge

2 ANS: 2 REF: 061007ge

3 ANS: 4

Lines b and e intersect and form vertical angles of 120° . Because the unmarked 120° and the marked 60° are same side interior angles and supplementary, $d \parallel e$.

REF: 080901ge

4 ANS: 2

$$5x - 22 = 3x + 10$$

$$2x = 32$$

$$x = 16$$

REF: 061403ge

5 ANS: 3

$$4x + 14 + 8x + 10 = 180$$

$$12x = 156$$

$$x = 13$$

REF: 081213ge

6 ANS: 2

$$7x = 5x + 30$$

$$2x = 30$$

$$x = 15$$

REF: 061106ge

7 ANS: 2

$$6x + 42 = 18x - 12$$

$$54 = 12x$$

$$x = \frac{54}{12} = 4.5$$

REF: 011201ge

8 ANS: 1

$$7x - 36 + 5x + 12 = 180$$

$$12x - 24 = 180$$

$$12x = 204$$

$$x = 17$$

REF: 011422ge

9 ANS: 4

$$2x + 36 + 7x - 9 = 180 \quad m\angle 1 = 2(17) + 36 = 70$$

$$9x + 27 = 180$$

$$9x = 153$$

$$x = 17$$

REF: 081427ge

10 ANS: 4

$$3x + 17 + 5x - 21 = 180 \quad m\angle 1 = 3(23) + 17 = 86$$

$$8x - 4 = 180$$

$$8x = 184$$

$$x = 23$$

REF: 011513ge

11 ANS: 3

$$7x = 5x + 30$$

$$2x = 30$$

$$x = 15$$

REF: 081109ge

12 ANS:

$$180 - (90 + 63) = 27$$

REF: 061230ge

13 ANS:

Yes, $m\angle ABD = m\angle BDC = 44$ $180 - (93 + 43) = 44$ $x + 19 + 2x + 6 + 3x + 5 = 180$. Because alternate interior

$$6x + 30 = 180$$

$$6x = 150$$

$$x = 25$$

$$x + 19 = 44$$

angles $\angle ABD$ and $\angle CDB$ are congruent, \overline{AB} is parallel to \overline{DC} .

REF: 081035ge