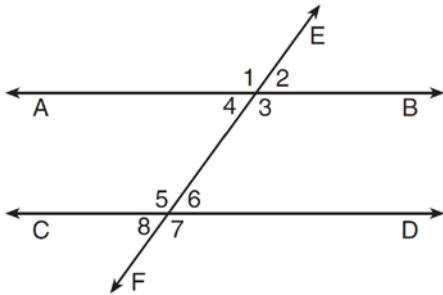## G.CO.C.9: Lines and Angles 2

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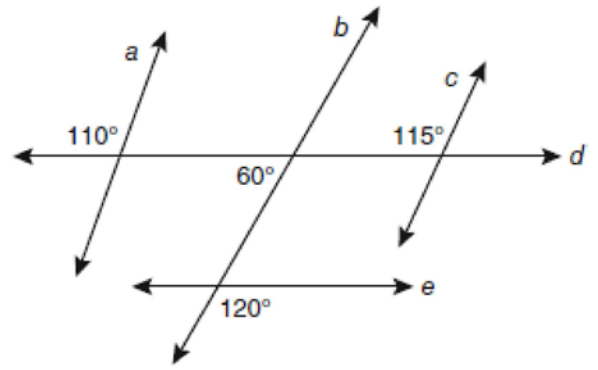
1) $a \parallel b$
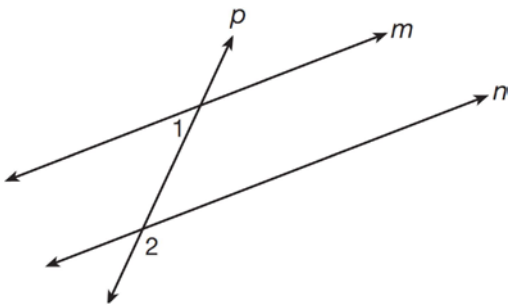2) $a \parallel c$
3) $b \parallel c$
4) $d \parallel e$

4 In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.
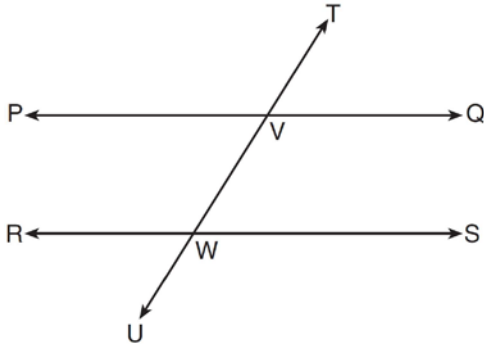
If m$\angle TVQ = 5x - 22$ and m$\angle VWS = 3x + 10$, for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$?
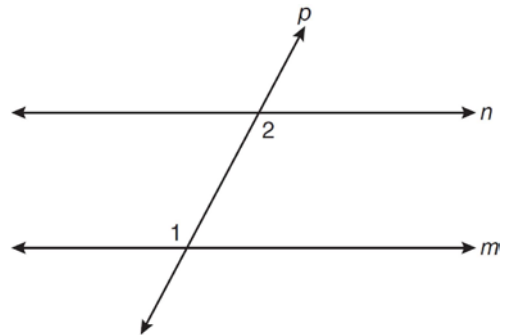1) 6
2) 16
3) 24
4) 28

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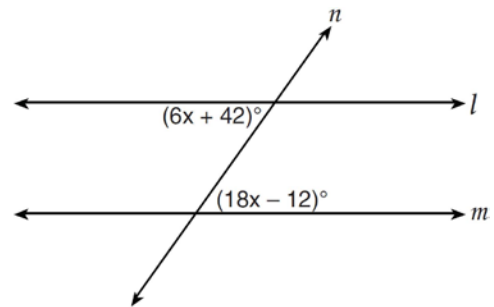
6 In the diagram below, line p intersects line m and line n.

If m$\angle 1 = 7x$ and m$\angle 2 = 5x + 30$, lines m and n are parallel when x equals
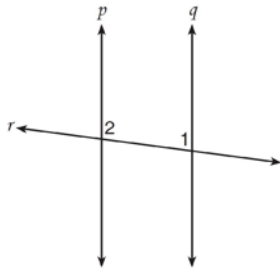1) 12.5
2) 15
3) 87.5
4) 105

7 Line n intersects lines l and m, forming the angles shown in the diagram below.

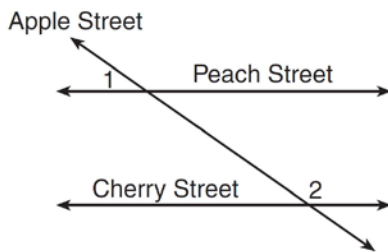Which value of x would prove $l \parallel m$?
1) 2.5
2) 4.5
3) 6.25
4) 8.75

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 $p \parallel q$?
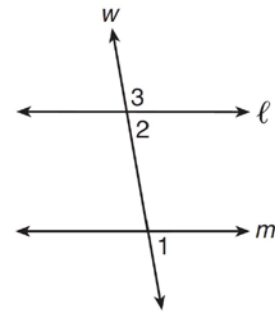1) 17
2) 24
3) 83
4) 97

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

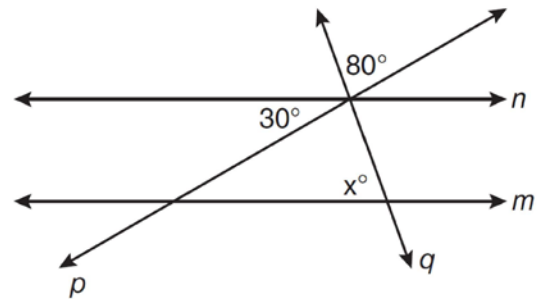10 In the diagram below, line ℓ is parallel to line m, and line w is a transversal.

(Not drawn to scale)

If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?
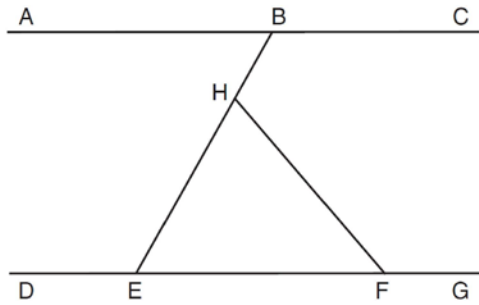1) 19
2) 23
3) 74
4) 86

11 In the diagram below, lines n and m are cut by transversals p and q.

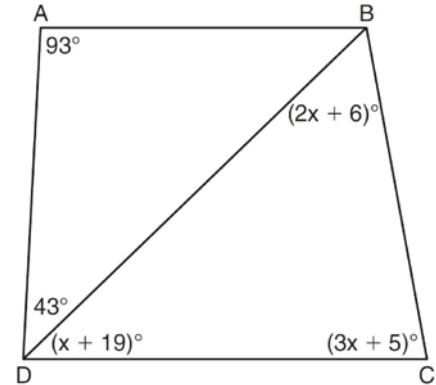What value of x would make lines n and m parallel?
1) 110
2) 80
3) 70
4) 50

3

12 In the diagram below, $\overline{ABC} \parallel \overline{DEFG}$. Transversal $\overline{BHE}$ and line segment HF are drawn.

If m∠HFG = 130 and m∠EHF = 70, what is m∠ABE?
1) 40
2) 50
3) 60
4) 70

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

If m∠1 = 63, find m∠2.

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

4
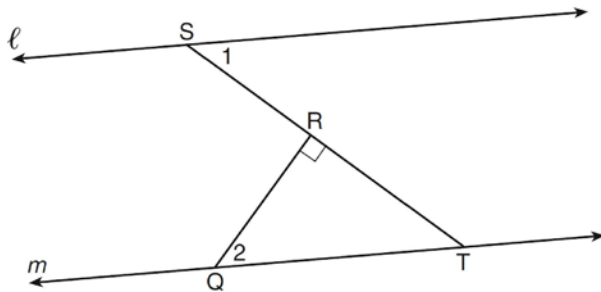
G.CO.C.9: Lines and Angles 2
Answer Section

1   ANS: 3   REF: 061320ge

2   ANS: 2   REF: 061007ge

3   ANS: 4

The marked 60º angle and the angle above it are on the same straight line and supplementary. This unmarked supplementary angle is 120º. Because the unmarked 120º angle and the marked 120º angle are alternate exterior angles and congruent, $d \parallel e$.

   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

$6x + 42 = 18x - 12$

$54 = 12x$

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

   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: 3   REF: 011612ge

13 ANS:
$$180 - (90 + 63) = 27$$

REF: 061230ge

14 ANS:

Yes, m∠ABD = m∠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 ∠ABD and ∠CDB are congruent, $\overline{AB}$ is parallel to $\overline{DC}$.

REF: 081035ge