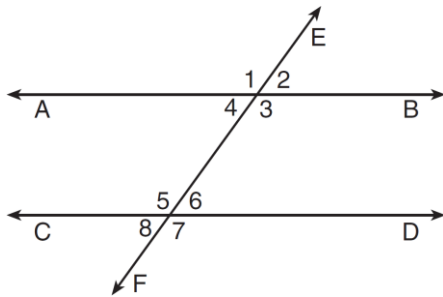**Name:** _____   **Date:** _____
**CC Geometry (H)**

Parallel Lines Cut by a Transversal

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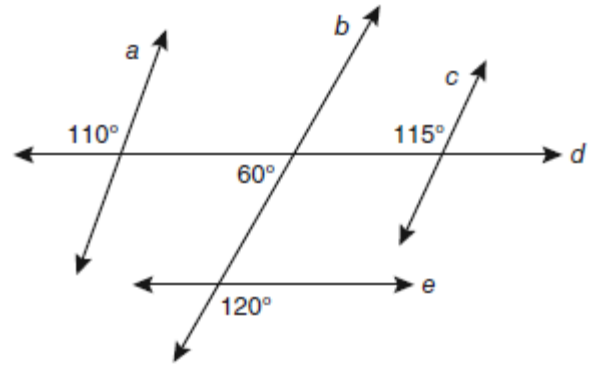
   1) $a \parallel b$
   2) $a \parallel c$
   3) $b \parallel c$
   4) $d \parallel e$
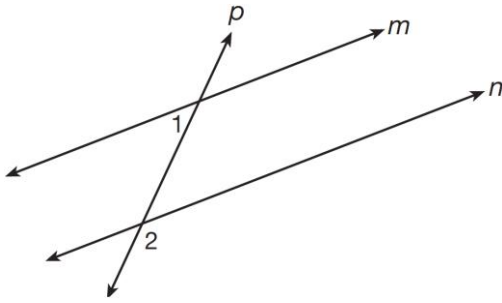
4. In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.
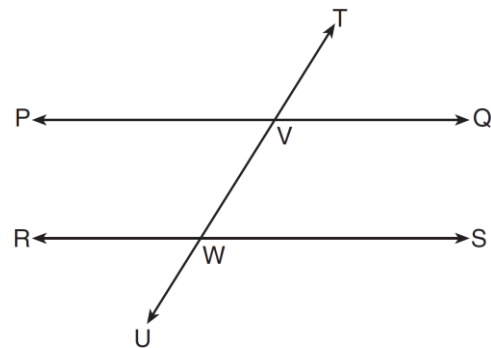
   If $m\angle TVQ = 5x - 22$ and $m\angle VWS = 3x + 10$, for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$?
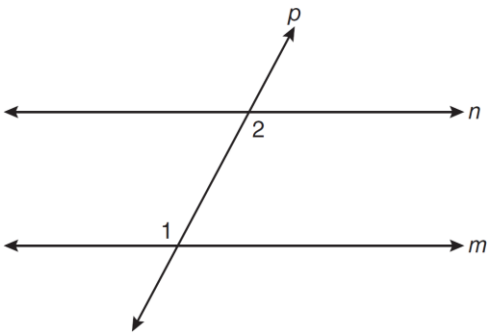
   1) 6
   2) 16
   3) 24
   4) 28

5. As shown in the diagram below, lines m and n are cut by transversal p.

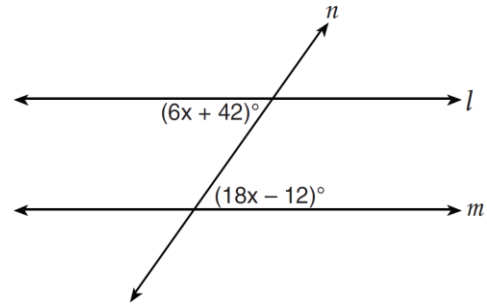If m∠1 = $4x + 14$ and m∠2 = $8x + 10$, lines m and n are parallel when x equals

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

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

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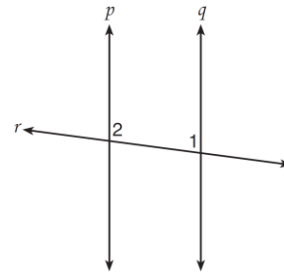1) 12.5
2) 15
3) 87.5
4) 105

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

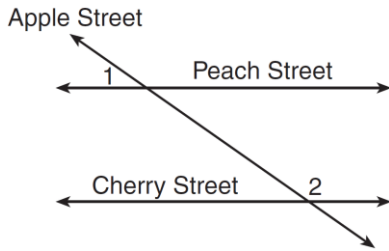Which value of x would prove $l \parallel m$?

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

1) 17
2) 24
3) 83
4) 97

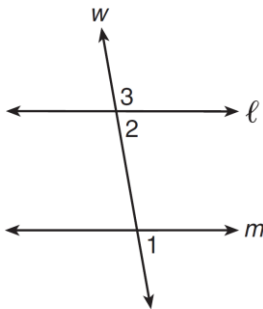9. Peach Street and Cherry Street are parallel. Apple Street intersects them, as shown in the diagram below.

Apple Street

Peach Street

1

Cherry Street   2

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.

w

3
2   ℓ

1   m
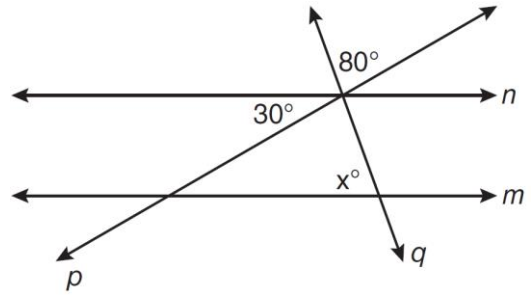
(Not drawn to scale)

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.

80°
30°   n

x°
m

q
p

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.

ℓ S
1

R

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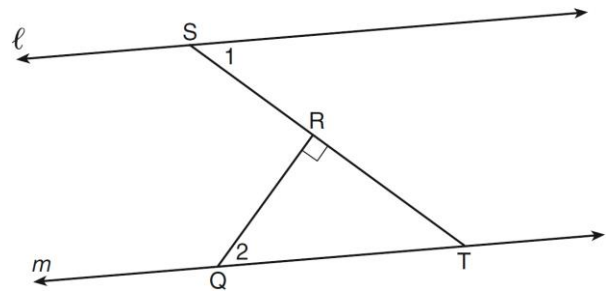
If $m\angle 1 = 63$, find $m\angle 2$.

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.

A — 93°

B

(2x + 6)°

43°

(x + 19)°

D

(3x + 5)°

C
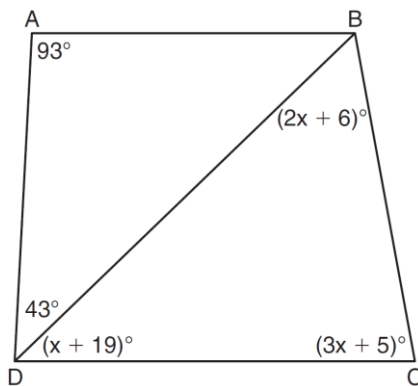
1 ANS: 3   REF: 061320ge
2 ANS: 2   REF: 061007ge
3 ANS: 4

Lines *b* and *e* intersect and form vertical angles of 120º. Because the unmarked 120º and the marked 60º 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

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

$\qquad 9x + 27 = 180$

$\qquad 9x = 153$

$\qquad x = 17$

REF: 081427ge

10   ANS: 4

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

$\qquad 8x - 4 = 180$

$\qquad 8x = 184$

$\qquad x = 23$

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

$\qquad 6x + 30 = 180$

$\qquad 6x = 150$

$\qquad x = 25$

$\qquad x + 19 = 44$

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

REF: 081035ge