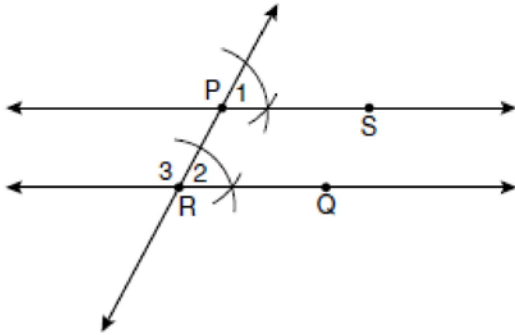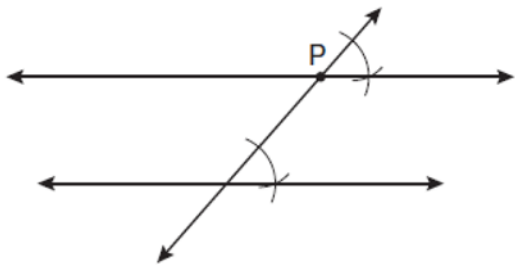## G.CO.D.12: Constructions 3

1 The diagram below illustrates the construction of $\overleftrightarrow{PS}$ parallel to $\overleftrightarrow{RQ}$ through point P.


Which statement justifies this construction?
1) $m\angle 1 = m\angle 2$
2) $m\angle 1 = m\angle 3$
3) $\overline{PR} \cong \overline{RQ}$
4) $\overline{PS} \cong \overline{RQ}$

2 Which geometric principle is used to justify the construction below?

1) A line perpendicular to one of two parallel lines is perpendicular to the other.
2) Two lines are perpendicular if they intersect to form congruent adjacent angles.
3) When two lines are intersected by a transversal and alternate interior angles are congruent, the lines are parallel.
4) When two lines are intersected by a transversal and the corresponding angles are congruent, the lines are parallel.

3 The diagram below shows the construction of $\overleftrightarrow{AB}$ through point P parallel to $\overleftrightarrow{CD}$.
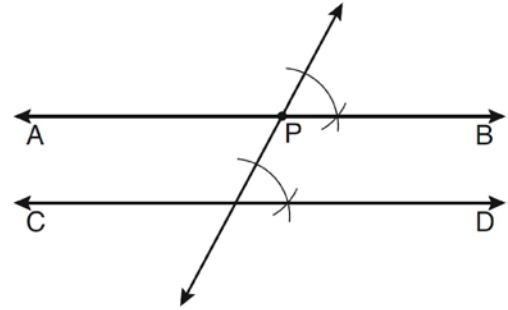
Which theorem justifies this method of construction?
1) If two lines in a plane are perpendicular to a transversal at different points, then the lines are parallel.
2) If two lines in a plane are cut by a transversal to form congruent corresponding angles, then the lines are parallel.
3) If two lines in a plane are cut by a transversal to form congruent alternate interior angles, then the lines are parallel.
4) If two lines in a plane are cut by a transversal to form congruent alternate exterior angles, then the lines are parallel.
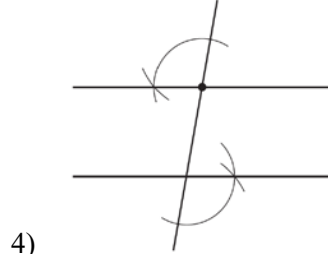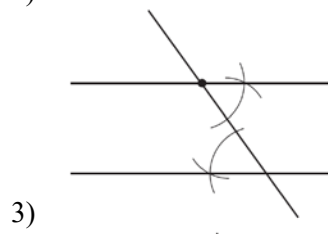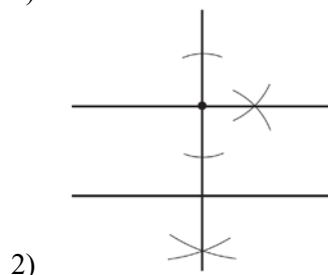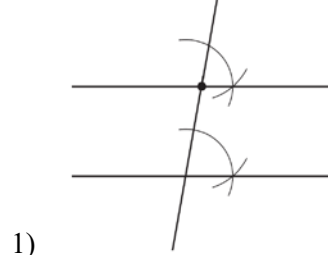
4   The diagram below shows the construction of line
   *m*, parallel to line ℓ, through point *P*.
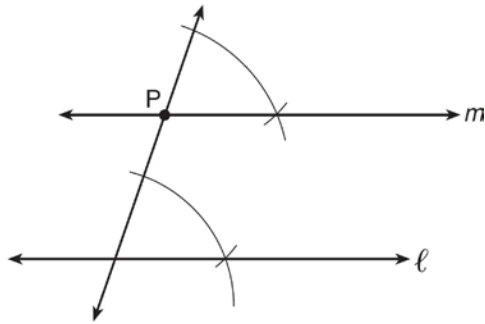
Which theorem was used to justify this
construction?
1)   If two lines are cut by a transversal and the
     alternate interior angles are congruent, the lines
     are parallel.
2)   If two lines are cut by a transversal and the
     interior angles on the same side are
     supplementary, the lines are parallel.
3)   If two lines are perpendicular to the same line,
     they are parallel.
4)   If two lines are cut by a transversal and the
     corresponding angles are congruent, they are
     parallel.

5   Which construction of parallel lines is justified by
    the theorem "If two lines are cut by a transversal to
    form congruent alternate interior angles, then the
   lines are parallel"?

1)

2)

3)

4)

6   The diagram below shows the construction of a line through point *P* perpendicular to line *m*.
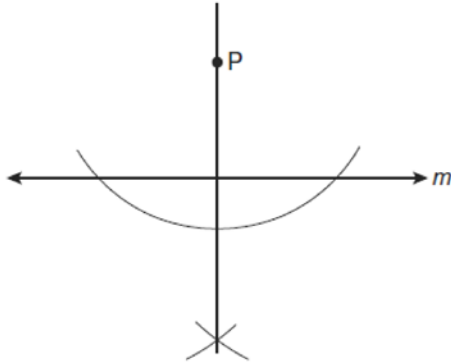

Which statement is demonstrated by this construction?
1)   If a line is parallel to a line that is perpendicular to a third line, then the line is also perpendicular to the third line.
2)   The set of points equidistant from the endpoints of a line segment is the perpendicular bisector of the segment.
3)   Two lines are perpendicular if they are equidistant from a given point.
4)   Two lines are perpendicular if they intersect to form a vertical line.

7   In the accompanying diagram of a construction, what does $\overline{PC}$ represent?
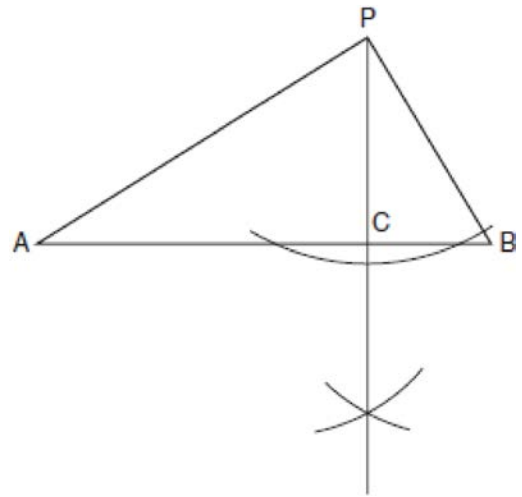
1)   an altitude drawn to $\overline{AB}$
2)   a median drawn to $\overline{AB}$
3)   the bisector of $\angle APB$
4)   the perpendicular bisector of $\overline{AB}$

3

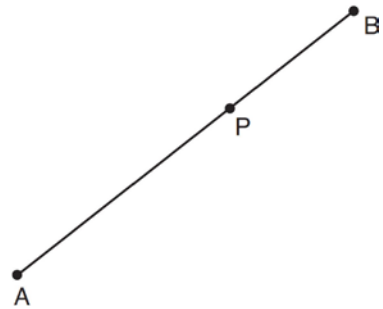8 Which diagram illustrates a correct construction of an altitude of △ABC?

1)

2)

3)

4)
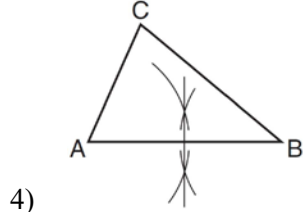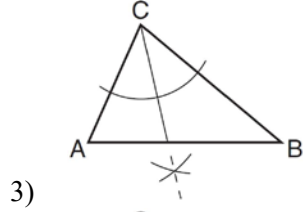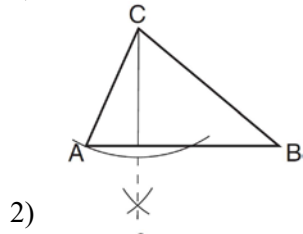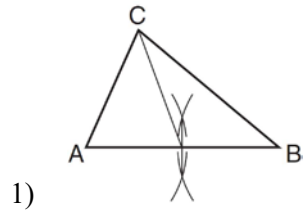
9 Using a compass and straightedge, construct a line that passes through point P and is perpendicular to line m. [Leave all construction marks.]
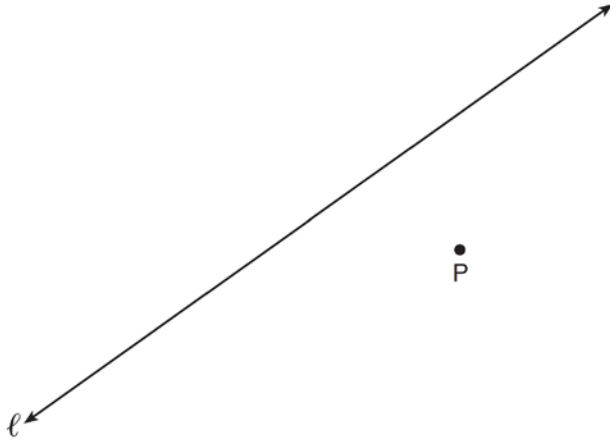
• P

← m →

10 Using a compass and straightedge, construct a line perpendicular to $\overline{AB}$ through point P. [Leave all construction marks.]
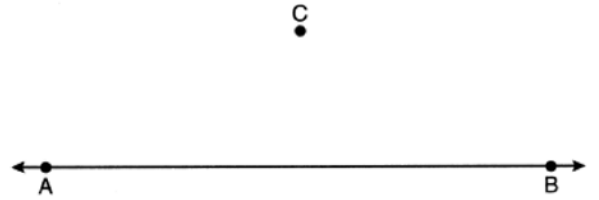
B

P

A

11 Given $\overline{MT}$ below, use a compass and straightedge to construct a 45° angle whose vertex is at point M. [Leave all construction marks.]
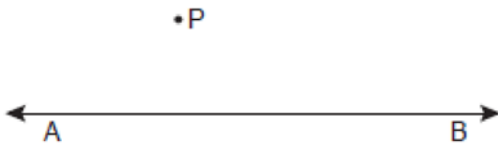
M   T

4

12 Using a compass and straightedge, construct a line perpendicular to line ℓ through point P. [Leave all construction marks.]
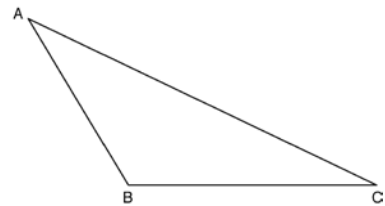
14 Use a compass and straightedge to construct a line parallel to $\overleftrightarrow{AB}$ through point C, shown below. [Leave all construction marks.]
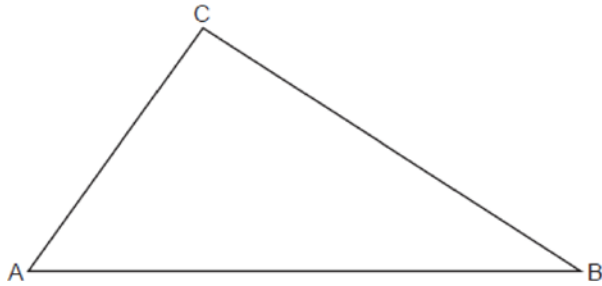
15 Using a compass and straightedge, construct an altitude of triangle ABC below. [Leave all construction marks.]

13 Using a compass and straightedge, construct the line that is perpendicular to $\overleftrightarrow{AB}$ and that passes through point P. Show all construction marks.
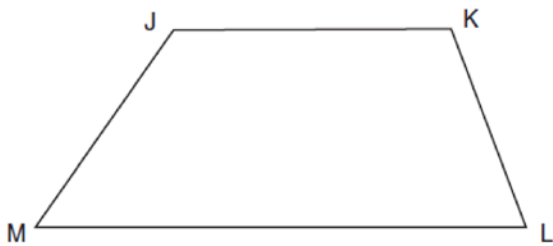
16 In △*ABC* below, use a compass and straightedge to construct the altitude from *C* to $\overline{AB}$. [Leave all construction marks.]

17 Given: Trapezoid *JKLM* with $\overline{JK} \parallel \overline{ML}$
Using a compass and straightedge, construct the altitude from vertex *J* to $\overline{ML}$. [Leave all construction marks.]

18 In the diagram below, radius $\overline{OA}$ is drawn in circle *O*. Using a compass and a straightedge, construct a line tangent to circle *O* at point *A*. [Leave all construction marks.]
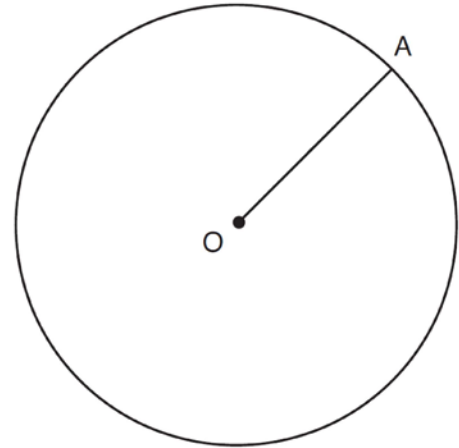
19 In the circle below, $\overline{AB}$ is a chord. Using a compass and straightedge, construct a diameter of the circle. [Leave all construction marks.]
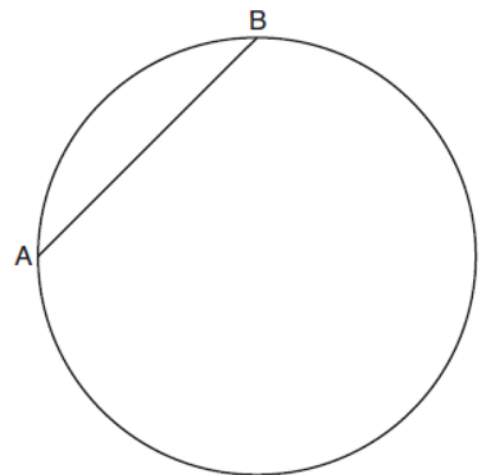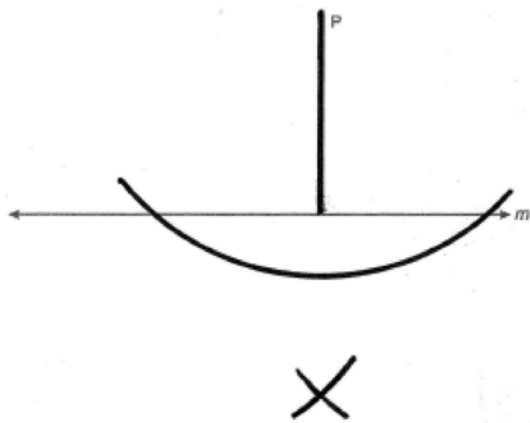
G.CO.D.12: Constructions 3
Answer Section

1 ANS: 1   REF: fall0807ge
2 ANS: 4   REF: 011009ge
3 ANS: 2   REF: 061208ge
4 ANS: 4   REF: 081313ge
5 ANS: 3   REF: 081512ge
6 ANS: 2   REF: 061020ge
7 ANS: 1

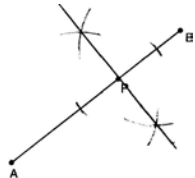 $\overline{PC}$ is perpendicular to $\overline{AB}$, but does not bisect it.
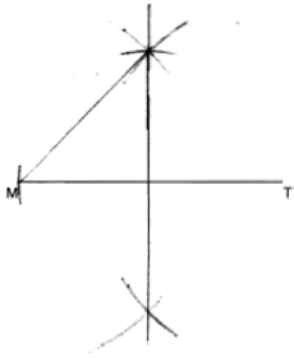
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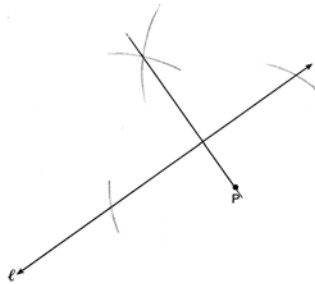8 ANS: 2   REF: 061512ge
9 ANS:

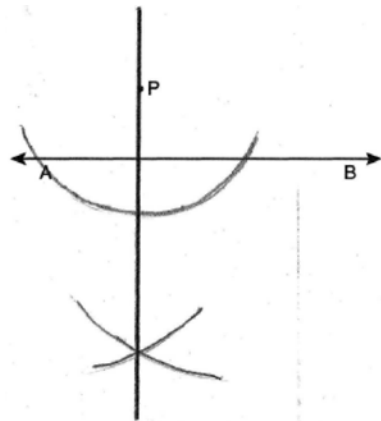
 REF: 060930ge

10 ANS:

 REF: 081233ge

11 ANS:

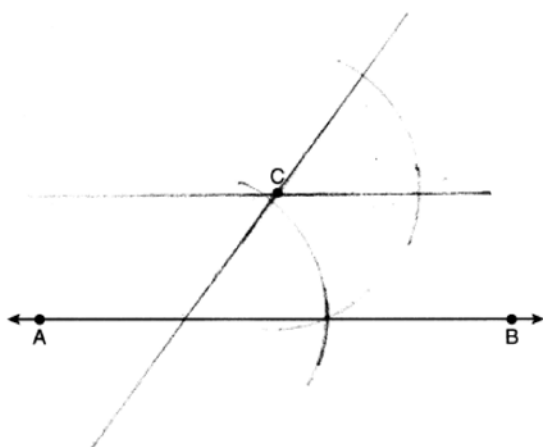REF: 012029geo

12 ANS:

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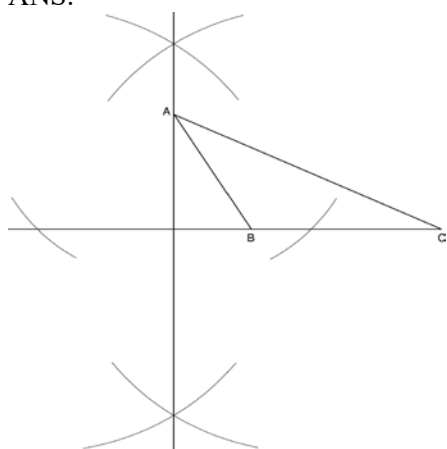
13 ANS:

REF: 080835a
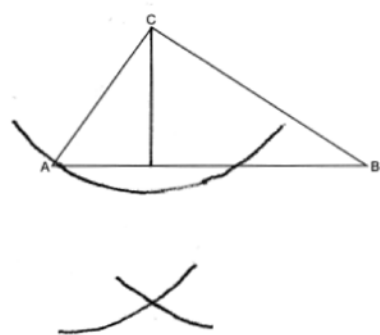
14 ANS:

REF: 062231geo

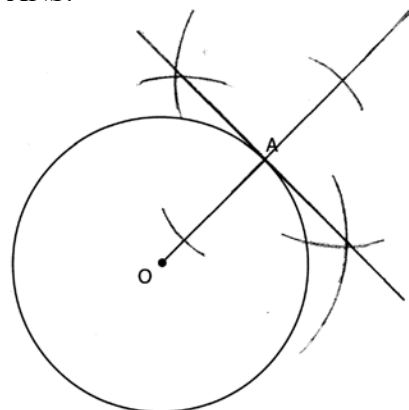15 ANS:

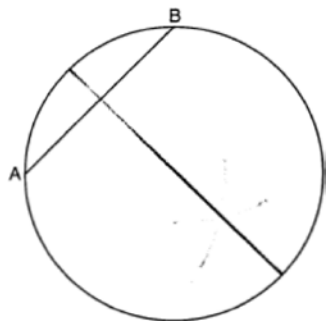REF: fall1409geo

16 ANS:

REF: 062325geo

17 ANS:

REF: 061725geo

18 ANS:

REF: 061631geo

19 ANS:

REF: 081825geo