1 The diagram below shows the construction of the bisector of $\angle A B C$.

Which statement is nottrue?

1) $\mathrm{m} \angle E B F=\frac{1}{2} \mathrm{~m} \angle A B C$
2) $\mathrm{m} \angle D B F=\frac{1}{2} \mathrm{~m} \angle A B C$
3) $\mathrm{m} \angle E B F=\mathrm{m} \angle A B C$
4) $\mathrm{m} \angle D B F=\mathrm{m} \angle E B F$


2 A student used a compass and a straightedge to construct $\overline{C E}$ in $\triangle A B C$ as shown below.

Which statement must always be true for this construction?

1) $\angle C E A \cong \angle C E B$
2) $\angle A C E \cong \angle B C E$
3) $\overline{A E} \cong \overline{B E}$
4) $\overline{E C} \cong \overline{A C}$


3 Based on the construction below, which statement must be true?

1) $\mathrm{m} \angle A B D=\frac{1}{2} \mathrm{~m} \angle C B D$
2) $\mathrm{m} \angle A B D=\mathrm{m} \angle C B D$
3) $\mathrm{m} \angle A B D=\mathrm{m} \angle A B C$
4) $\mathrm{m} \angle C B D=\frac{1}{2} \mathrm{~m} \angle A B D$


4 A straightedge and compass were used to create the construction below. Arc EFwas drawn from point $B$, and arcs with equal radii were drawn from $E$ and $F$.

Which statement is false?

1) $\mathrm{m} \angle A B D=\mathrm{m} \angle D B C$
2) $\frac{1}{2}(\mathrm{~m} \angle A B C)=\mathrm{m} \angle A B D$
3) $2(\mathrm{~m} \angle D B C)=\mathrm{m} \angle A B C$
4) $2(\mathrm{~m} \angle A B C)=\mathrm{m} \angle C B D$


5 As shown in the diagram below of $\triangle A B C$, a compass is used to find points $D$ and $E$, equidistant from point $A$. Next, the compass is used to find point $F$, equidistant from points $D$ and $E$. Finally, a straightedge is used to draw $\overrightarrow{A F}$. Then, point $G$, the intersection of $\overrightarrow{A F}$ and side $\overline{B C}$ of $\triangle A B C$, is labeled.

Which statement must be true?

1) $\overrightarrow{A F}$ bisects side $\overrightarrow{B C}$
2) $\overrightarrow{A F}$ bisects $\angle B A C$
3) $\overrightarrow{A F} \perp \overrightarrow{B C}$
4) $\triangle A B G \sim \triangle A C G$


6 Which diagram shows the construction of a $45^{\circ}$ angle?
1)

3)

2)

4)


7 Which illustration shows the correct construction of an angle bisector?
1)

2)

3)

4)


1 One step in a construction uses the endpoints of $\overline{A B}$ to create arcs with the same radii. The arcs intersect above and below the segment. What is the relationship of $\overline{A B}$ and the line connecting the points of intersection of these arcs?

1) collinear
2) congruent
3) parallel
4) perpendicular

2 Line segment $A B$ is shown in the diagram below.
Which two sets of construction marks, labeled I, II, III, and IV, are part of the construction of the perpendicular bisector of line segment $A B$ ?

1) I and II
2) I and III
3) II and III
4) II and IV


3 In the construction shown below, $\overline{C D}$ is drawn.

In $\triangle A B C, \overline{C D}$ is the

1) perpendicular bisector of side $\overline{A B}$
2) median to side $\overline{A B}$
3) altitude to side $\overline{A B}$
4) bisector of $\angle A C B$


4 The diagram below shows the construction of the perpendicular bisector of $\overline{A B}$.

Which statement is nottrue?

1) $A C=C B$
2) $C B=\frac{1}{2} A B$
3) $A C=2 A B$
4) $A C+C B=A B$


5 Based on the construction below, which conclusion is notalways true?

1) $\overline{A B} \perp \overline{C D}$
2) $A B=C D$
3) $A E=E B$
4) $C E=D E$


6 Which diagram shows the construction of the perpendicular bisector of $\overline{A B}$ ?
1)
2)

3)


1 The diagram below illustrates the construction of $\overleftrightarrow{P S}$ parallel to $\overleftrightarrow{R Q}$ through point $P$.

Which statement justifies this construction?

1) $\mathrm{m} \angle 1=\mathrm{m} \angle 2$
2) $\underline{m} \angle 1=\mathrm{m} \angle 3$
3) $\overline{P R} \cong \overline{R Q}$
4) $\overline{P S} \cong \overline{R Q}$


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 $\overleftrightarrow{A B}$ through point P parallel to $\overleftrightarrow{C D}$.
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 $\ell$, 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)

3)

2)

4)


6 The diagram below shows the construction of a line through point Pperpendicular to line.

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 $\overline{P C}$ represent?

1) an altitude drawn to $\overline{A B}$
2) a median drawn to $\overline{A B}$
3) the bisector of $\angle A P B$
4) the perpendicular bisector of $\overline{A B}$


8 Which diagram illustrates a correct construction of an altitude of $\triangle A B C$ ?
1)

3)

2)

4)


1 Which diagram shows the construction of an equilateral triangle?
1)

3)

2)

4)


2 Which diagram represents a correct construction of equilateral $\triangle A B C$, given side $\overline{A B}$ ?
1)

3)


4)


3 The diagram below shows the construction of an equilateral triangle.

Which statement justifies this construction?

1) $\angle A+\angle B+\angle C=180$
2) $\mathrm{m} \angle A=\mathrm{m} \angle B=\mathrm{m} \angle C$
3) $A B=A C=B C$
4) $A B+B C>A C$

