1. In the diagram below, line $k$ is perpendicular to plane $P$ at point $T$.

Which statement is true?
1) Any point in plane $P$ also will be on line $k$.
2) Only one line in plane $P$ will intersect line $k$.
3) All planes that intersect plane $P$ will pass through $T$.
4) Any plane containing line $k$ is perpendicular to plane $P$.

2. In the diagram below, $AB$ is perpendicular to plane $AEFG$.

Which plane must be perpendicular to plane $AEFG$?
1) $ABCE$
2) $BCDH$
3) $CDEF$
4) $HDFG$
3 Lines \(k_1\) and \(k_2\) intersect at point \(E\). Line \(m\) is perpendicular to lines \(k_1\) and \(k_2\) at point \(E\).

Which statement is always true?
1) Lines \(k_1\) and \(k_2\) are perpendicular.
2) Line \(m\) is parallel to the plane determined by lines \(k_1\) and \(k_2\).
3) Line \(m\) is perpendicular to the plane determined by lines \(k_1\) and \(k_2\).
4) Line \(m\) is coplanar with lines \(k_1\) and \(k_2\).

4 If two different lines are perpendicular to the same plane, they are
1) collinear
2) coplanar
3) congruent
4) consecutive

5 Point \(P\) lies on line \(m\). Point \(P\) is also included in distinct planes \(Q, R, S,\) and \(T\). At most, how many of these planes could be perpendicular to line \(m\)?
1) 1
2) 2
3) 3
4) 4

6 In plane \(\mathcal{P}\), lines \(m\) and \(n\) intersect at point \(A\). If line \(k\) is perpendicular to line \(m\) and line \(n\) at point \(A\), then line \(k\) is
1) contained in plane \(\mathcal{P}\)
2) parallel to plane \(\mathcal{P}\)
3) perpendicular to plane \(\mathcal{P}\)
4) skew to plane \(\mathcal{P}\)

7 Lines \(j\) and \(k\) intersect at point \(P\). Line \(m\) is drawn so that it is perpendicular to lines \(j\) and \(k\) at point \(P\). Which statement is correct?
1) Lines \(j\) and \(k\) are in perpendicular planes.
2) Line \(m\) is in the same plane as lines \(j\) and \(k\).
3) Line \(m\) is parallel to the plane containing lines \(j\) and \(k\).
4) Line \(m\) is perpendicular to the plane containing lines \(j\) and \(k\).

8 In three-dimensional space, two planes are parallel and a third plane intersects both of the parallel planes. The intersection of the planes is a
1) plane
2) point
3) pair of parallel lines
4) pair of intersecting lines

9 Line \(k\) is drawn so that it is perpendicular to two distinct planes, \(P\) and \(R\). What must be true about planes \(P\) and \(R\)?
1) Planes \(P\) and \(R\) are skew.
2) Planes \(P\) and \(R\) are parallel.
3) Planes \(P\) and \(R\) are perpendicular.
4) Plane \(P\) intersects plane \(R\) but is not perpendicular to plane \(R\).
10 Plane $A$ is parallel to plane $B$. Plane $C$ intersects plane $A$ in line $m$ and intersects plane $B$ in line $n$. Lines $m$ and $n$ are
1) intersecting
2) parallel
3) perpendicular
4) skew

11 Lines $m$ and $n$ intersect at point $A$. Line $k$ is perpendicular to both lines $m$ and $n$ at point $A$. Which statement must be true?
1) Lines $m$, $n$, and $k$ are in the same plane.
2) Lines $m$ and $n$ are in two different planes.
3) Lines $m$ and $n$ are perpendicular to each other.
4) Line $k$ is perpendicular to the plane containing lines $m$ and $n$.

12 Point $A$ is not contained in plane $B$. How many lines can be drawn through point $A$ that will be perpendicular to plane $B$?
1) one
2) two
3) zero
4) infinite

13 Plane $R$ is perpendicular to line $k$ and plane $D$ is perpendicular to line $k$. Which statement is correct?
1) Plane $R$ is perpendicular to plane $D$.
2) Plane $R$ is parallel to plane $D$.
3) Plane $R$ intersects plane $D$.
4) Plane $R$ bisects plane $D$.

14 Through a given point, $P$, on a plane, how many lines can be drawn that are perpendicular to that plane?
1) 1
2) 2
3) more than 2
4) none

15 If two distinct planes, $A$ and $B$, are perpendicular to line $c$, then which statement is true?
1) Planes $A$ and $B$ are parallel to each other.
2) Planes $A$ and $B$ are perpendicular to each other.
3) The intersection of planes $A$ and $B$ is a line parallel to line $c$.
4) The intersection of planes $A$ and $B$ is a line perpendicular to line $c$.

16 A support beam between the floor and ceiling of a house forms a $90^\circ$ angle with the floor. The builder wants to make sure that the floor and ceiling are parallel. Which angle should the support beam form with the ceiling?
1) $45^\circ$
2) $60^\circ$
3) $90^\circ$
4) $180^\circ$

17 Point $P$ is on line $m$. What is the total number of planes that are perpendicular to line $m$ and pass through point $P$?
1) 1
2) 2
3) 0
4) infinite
G.CO.A.1: Planes 1
Answer Section

1  ANS:  4  REF:  080914ge
2  ANS:  1  REF:  081116ge
3  ANS:  3  REF:  fall0816ge
4  ANS:  2  REF:  080927ge
5  ANS:  1  REF:  011128ge
6  ANS:  3  REF:  061017ge
7  ANS:  4  REF:  011012ge
8  ANS:  3  REF:  060928ge
9  ANS:  2  REF:  fall0806ge
10  ANS:  2  REF:  081120ge
11  ANS:  4  REF:  061118ge
12  ANS:  1  REF:  081008ge
13  ANS:  2  REF:  011109ge
14  ANS:  1  REF:  011024ge
15  ANS:  1  REF:  061108ge
16  ANS:  3  REF:  081002ge
17  ANS:  1  REF:  060918ge