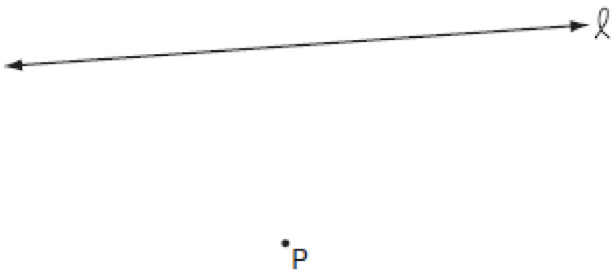
G.G.22: Locus 2: Solve problems using compound loci

1 In the accompanying diagram, point P lies 3 centimeters from line ℓ.



How many points are both 2 centimeters from line ℓ and 1 centimeter from point P?
1) 1
2) 2
3) 0
4) 4

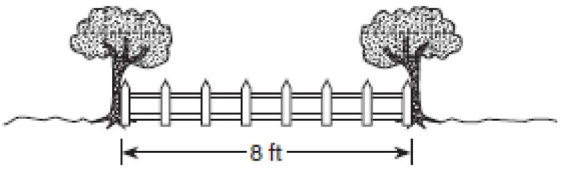
2 The distance between points P and Q is eight (8) units. How many points are equidistant from P and Q and also three (3) units from P?
1) 1
2) 2
3) 0
4) 4

3 The distance between parallel lines ℓ and m is 12 units. Point A is on line ℓ. How many points are equidistant from lines ℓ and m and 8 units from point A.
1) 1
2) 2
3) 3
4) 4

4 What is the total number of points equidistant from two intersecting straight roads and also 300 feet from the traffic light at the center of the intersection?
1) 1
2) 2
3) 3
4) 4

5 How many points are equidistant from two parallel lines and also equidistant from two points on one of the lines?
1) 1
2) 2
3) 3
4) 4

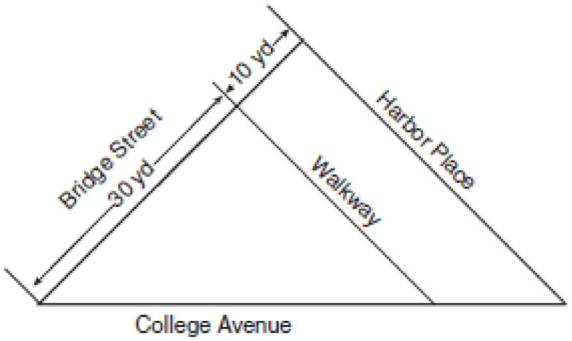
6 Steve has a treasure map, represented in the accompanying diagram, that shows two trees 8 feet apart and a straight fence connecting them. The map states that treasure is buried 3 feet from the fence and equidistant from the two trees.



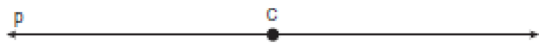
a Sketch a diagram to show all the places where the treasure could be buried. Clearly indicate in your diagram where the treasure could be buried.
b What is the distance between the treasure and one of the trees?

Name: _____

7 A triangular park is formed by the intersection of three streets, Bridge Street, Harbor Place, and College Avenue, as shown in the accompanying diagram. A walkway parallel to Harbor Place goes through the park. A time capsule has been buried in the park in a location that is equidistant from Bridge Street and College Avenue and 5 yards from the walkway. Indicate on the diagram with an **X** *each* possible location where the time capsule could be buried.



8 In the diagram below, town *C* lies on straight road *p*. Sketch the points that are 6 miles from town *C*. Then sketch the points that are 3 miles from road *p*. How many points satisfy both conditions?



9 Point *P* is located on $\overleftrightarrow{AB}$.
a Describe the locus of points that are
3 units from $\overleftrightarrow{AB}$
5 units from point *P*
b How many points satisfy both conditions in part *a*?

10 A treasure map shows a treasure hidden in a park near a tree and a statue. The map indicates that the tree and the statue are 10 feet apart. The treasure is buried 7 feet from the base of the tree and also 5 feet from the base of the statue. How many places are possible locations for the treasure to be buried? Draw a diagram of the treasure map, and indicate with an **X** *each* possible location of the treasure.

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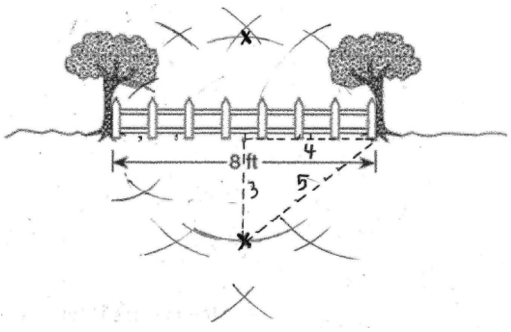
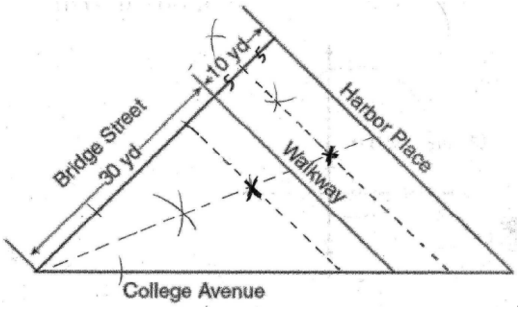
Answer Section

1 ANS: 1 REF: 010623a
2 ANS: 3 REF: spring9817a
3 ANS: 2 REF: 010020a
4 ANS: 4 REF: 080203a
5 ANS: 1 REF: 010527a
6 ANS:



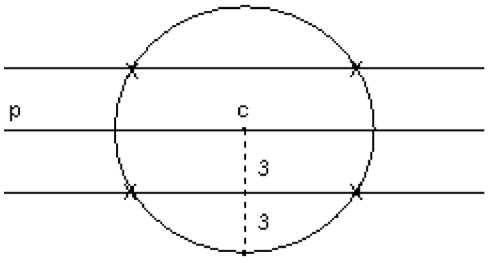
. 5 feet. Bisecting the 8 ft segment creates two 4 ft segments. Bisecting one of the 4 ft segments creates two 2 ft segments. Bisecting one of the 2 ft segments creates two 1 ft segments, which can be used to construct a 3 ft segment.

REF: 010127a
7 ANS:



. Bisect the angle created by Bridge Street and College Avenue to mark the locus of points equidistant from Bridge Street and College Avenue. Bisect the 10 yd segment to construct a 5 yd segment. Use this distance to mark the two loci of points 5 yards from the walkway.

REF: 060332a
8 ANS:



4

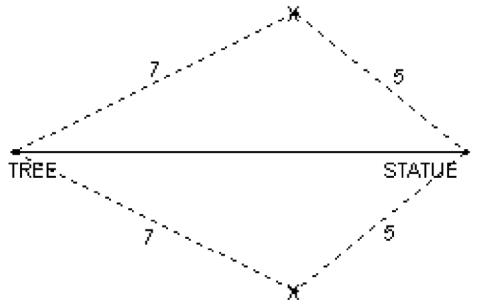
REF: 080737a

9 ANS:

The locus of points that are 3 units from $\overleftrightarrow{AB}$ are two lines parallel to $\overleftrightarrow{AB}$, one 3 units above $\overleftrightarrow{AB}$ and the other 3 units below $\overleftrightarrow{AB}$. The locus of points that are 5 units from point P is a circle with radius of 5. 4 points satisfy both conditions.

REF: 080131a

10 ANS:



2

REF: 060032a