

Construction and Loci

Identify each locus, describe the region, and solve compound problems.



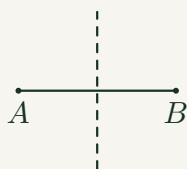
Name _____

Date _____

Show your reasoning

Name the locus (circle, parallel lines, perpendicular bisector, or angle bisector) and state the condition every point on it satisfies. For compound problems, describe both loci before finding the intersection.

Worked example Describe the locus of points equidistant from points A and B .



This is the perpendicular bisector of AB .
Every point on this line is the same distance from A as from B .
The line crosses AB at its midpoint, at right angles.

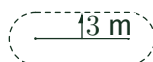
1. Describe the locus shown.

Solution: Circle, centre P , radius 4 cm



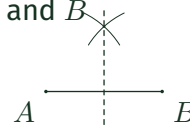
2. Describe the locus shown.

Solution: Two parallel lines, each 3 m from l



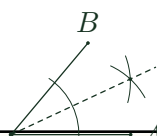
3. Which construction is shown? What do all points on the resulting line have in common?

Solution: Perpendicular bisector of AB ; equal distance from A and B



4. Which construction is shown? If the marked angle is 50° , what two equal angles does the bisector make?

Solution: Angle bisector; 25° and 25°



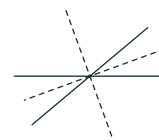
5. What locus is shown, and what condition does every point on it satisfy?

Solution: Perpendicular bisector of AB ; equal distance from A and B



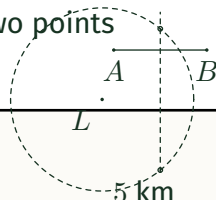
6. What locus is shown for these two intersecting lines?

Solution: Both angle bisectors; equal distance from both lines



7. This diagram combines two loci. Describe both conditions, and how many points satisfy them.

Solution: Perp. bisector of AB and circle centre L radius 5 km; two points



8. A goat is tied to a post with a 6 m rope. Describe the locus of points the goat can reach.

Solution: Circle, centre the post, radius 6 m

9. A cyclist must stay exactly 2 m from a straight fence, on one side only. Is the locus a full pair of lines, or just one line?

Solution: Just one line

Construction and Loci (continued)



Describe regions, apply the constructions, and reason about compound loci.

Name _____

Date _____

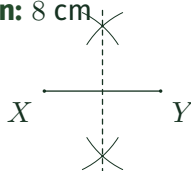
10. The dashed circle is the locus exactly 5 cm from P . Describe the region *within* 5 cm of P instead.

Solution: The shaded disc inside (and on) the circle



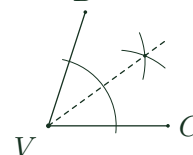
11. A point on this line is 8 cm from X . How far is it from Y ?

Solution: 8 cm



12. The marked angle is 72° . What two equal angles does the bisector make?

Solution: 36° and 36°



13. Two straight roads cross at 90° . Describe the locus of points equidistant from both roads.

Solution: Both angle bisectors of the roads, perpendicular to each other

16. Two parallel paths are 6 m apart. Describe the locus of points equidistant from both paths.

Solution: The line midway between them, parallel to both

14. A radio mast covers a circular area of radius 15 km. Describe the region it covers.

Solution: The shaded disc inside (and on) the radius-15 km circle

17. A dog is tied to post P with a 3 m lead, but a wall blocks the ground directly behind P . Is the locus a full circle, or only part of one?

Solution: Only part of one

15. Treasure is equidistant from tree A and rock B , and exactly 10 m from well W . At most, how many possible locations?

Solution: At most two

18. Write one sentence explaining what a locus is.

Solution: The set of all points satisfying a given rule or condition