

Push Tasks – Answers



1. Points must be equal distance from A and B , and also 5 cm from A . What two loci should be intersected?

Solution The perpendicular bisector of AB and the circle, centre A , radius 5 cm.

4. Explain why every point on the perpendicular bisector of AB is the same distance from A and B .

Solution Reflecting in the bisector swaps A and B , so each of its points is equidistant.

7. Two parallel fences are 10 m apart. What is the locus of points equal distance from both?

Solution The line midway between them (5 m from each),

2. If $AB = 12$ cm, can a point be equal distance from A and B and also only 4 cm from A ? Explain briefly.

Solution No — the bisector's nearest point to A is the midpoint, 6 cm away.

5. A campsite is exactly 4 km from lake L and equal distance from towns A and B . At most, how many sites are possible?

Solution At most two — a line meets a circle in up to 2 points.

8. Why does changing the compass width while drawing a circle break the locus condition?

Solution The distance from the centre stops being constant, so

3. Two roads cross at 60° . Once both angle bisectors are drawn, what angles do they make with the roads?

Solution Internal bisector 30° ; external bisector 60° .

6. A sprinkler reaches exactly 6 m from point P , but only south of P . What part of the circle locus is needed?

Solution The southern half — a semicircular arc.

9. Why can a ruler-without-markings and a compass still find the midpoint of AB ?

Solution Equal arcs from A and B give equidistant points; their

Push Tasks – Answers



10. One point is on the internal, another on the external bisector of an 80° angle. Angle between them?

Solution 90° — the two bisectors are always perpendicular.

13. A path must stay within 2 m of line l . Is the boundary a pair of lines or a circle?



Solution A pair of parallel lines, 2 m each side of l .

16. A perpendicular bisector and a circle do not meet. What does that tell you?

Solution No point meets both conditions — the problem has no solution.

11. A school is equal distance from A and B, inside a 3 km safety circle around C. Describe the solution set.

Solution The part of the perpendicular bisector of AB inside the 3 km circle about C.

14. A point is on the perpendicular bisector of AB and $AX = 9$ cm. What is BX?



Solution $BX = 9$ cm — on the bisector $AX = BX$.

17. If they meet in two places, why are there two valid answers?

Solution Each crossing point satisfies both loci, so both are valid.

12. Two equal circles centred at A, B have AB equal to the radius. What triangle do A, B, and an intersection form?

Solution An equilateral triangle — all three sides equal the radius.

15. A point is on an angle bisector of 34° . What are the two equal angles?



Solution 17° and 17° ($34^\circ \div 2$).

18. A point must be 3 m from crossing walls w, v. Better to start with: circle or angle bisector?

Solution The angle bisector (equal distance from both

Push Tasks – Answers



19. A point is equidistant from two parallel lines, and 4 cm from P on the midline. Max solutions?

Solution At most two — the midline meets the circle in up to 2 points.

22. What is the locus of points exactly halfway between two parallel roads?

Solution The middle line, parallel to both roads.

25. A point is exactly 2 cm from line l and from P . One locus, or the intersection of two?

Solution The intersection of two loci — the lines 2 cm from l and the circle 2 cm from P .

20. Why is the midpoint of AB guaranteed to lie on the perpendicular bisector of AB ?

Solution It is equally far from A and B , which is exactly the bisector's rule.

23. Give one reason why an angle bisector is useful in real design or surveying work.

Solution It centres a path or feature equally between two edges or boundaries.

26. Why do construction problems often end by checking where two loci cross?

Solution Each crossing point satisfies every condition at once, giving the solution.

21. A circle has centre O . Is the centre itself on the locus of points 5 cm from O ? Explain.

Solution No — O is 0 cm from itself, not 5 cm.

24. If a point is inside a circle of radius 5 cm, can it be on the locus of points exactly 5 cm from the centre?

Solution No — inside points are under 5 cm; the locus is the boundary only.

27. Write one sentence that explains what a locus is.

Solution A locus is the set of all points that obey a given rule.