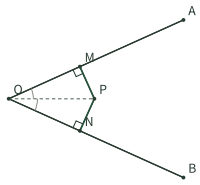
Angle bisectors: the converse and applications — Further practice

Year 8, upper volume • text pp. 27–28 • foundation lesson 14

Further practice 11

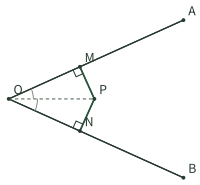
P lies on the internal bisector, PM⊥OA and PN⊥OB. PM=3 cm and △OPM has perimeter 12 cm. Find OP+ON.



Geometry diagram; not drawn to scale except for construction tasks.

Further practice 12

P lies on the internal bisector, PM⊥OA and PN⊥OB. PM=9 cm and △OPM has perimeter 36 cm. Find OP+ON.

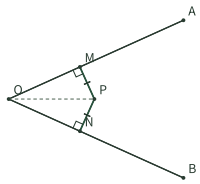


Geometry diagram; not drawn to scale except for construction tasks.

Further practice 13

P is inside the angle, PM⊥OA, PN⊥OB and PM=PN=5 cm. Which conclusion follows directly?

A. OP bisects the angle; its length is not determined by 5 cm alone.
B. OP=5 cm.
C. The whole angle must be 90°.
D. M=N.



Geometry diagram; not drawn to scale except for construction tasks.

Further practice 14

Complete two sentences: forward direction, given ___, prove equal perpendicular distances; converse, given ___, prove the internal bisector. Include all position and perpendicular conditions.

Extension 15

I is inside △ABC and lies on the internal bisectors at A and B. Let D,E,F be its perpendicular feet on AB,AC,BC respectively. Prove that I also lies on the internal bisector at C.

Extension 16

Someone puts P=O, obtains two zero distances, and tries to use HL to define the ray OP as an angle bisector. Explain why this proof setup fails.