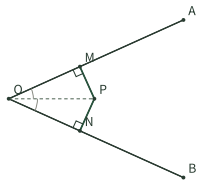
Angle bisectors: perpendicular distances and the forward proof — Further practice

Year 8, upper volume • text pp. 25–26 • foundation lesson 13

Further practice 11

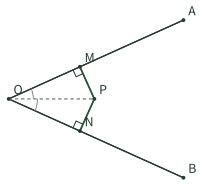
P lies on the internal bisector, with PM⊥OA and PN⊥OB. PM=3.75 cm. Find PN.



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=3x−1 cm and PN=8 cm. Find x.



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

Further practice 13

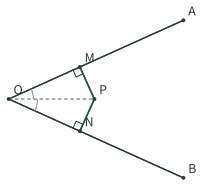
To prove PM=PN from OP bisecting the angle and the two perpendicular conditions, which starting data are legitimate?

A. Two right angles, equal angles at O, and OP common.

B. PM=PN, so HL applies immediately.

C. Three equal angles prove congruence by AAA.

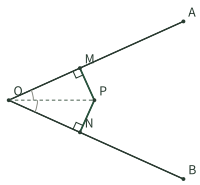
D. Assume OM=ON without justification.



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

Further practice 14

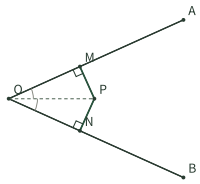
P is on the internal bisector, PM⊥OA and PN⊥OB. PM=6 cm and △OPM has perimeter 24 cm. Find OP+ON.



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

Extension 15

Three trials show the same rounded values for PM and PN. Explain what this supports, and what is still needed for every point on the bisector.



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

Extension 16

A pupil says every point inside an angle has equal distances to the sides. A point Q inside the angle has perpendicular distances 2 cm and 4 cm. Is it a counterexample, and what condition repairs the claim?