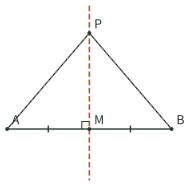
Perpendicular bisectors: properties and the SSS converse

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Worked example 1

M is the midpoint of AB. P is off AB and PM⊥AB. Prove PA=PB.

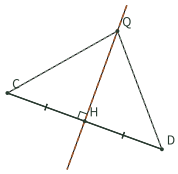


Geometry diagram; not drawn to scale except for construction tasks.

Guided attempt 2

H is the midpoint of CD, Q is off CD and QH⊥CD. Complete a proof that QC=QD.

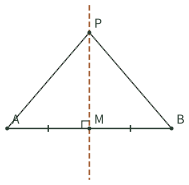
1. CH=___ because H is ___.
2. ∠QHC=∠___=___ because ___.
3. ___ is common; the criterion is ___.
4. Therefore QC=QD by ___.



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

Prerequisite 3

M is the midpoint of AB and AB=10 cm. Find AM.

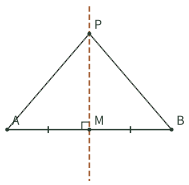


Geometry diagram; not drawn to scale except for construction tasks.

Prerequisite 4

A,M,B are collinear, P is off AB and PM⊥AB. What is ∠PMA?

A. 45° B. 180°
C. It must equal the length AM. D. 90°



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

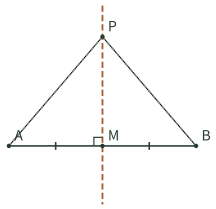
Perpendicular bisectors: properties and the SSS converse

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Independent practice 5

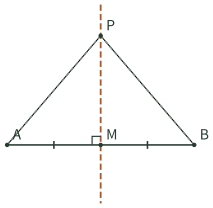
M is the midpoint of AB and AB=18 cm. Find AM.



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

Independent practice 6

P lies on the perpendicular bisector of AB. If PA=8 cm, find PB and state the property.

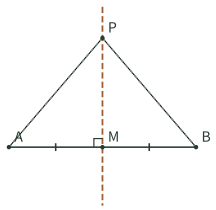


Geometry diagram; not drawn to scale except for construction tasks.

Independent practice 7

P lies on the perpendicular bisector of AB. PA=3x+1 cm and PB=2x+5 cm. Find x and check both distances.

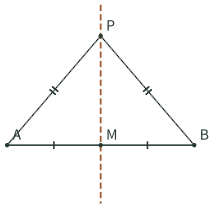
$$3x + 1 = 2x + 5$$



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

Independent practice 8

P is off AB and PA=PB. M is the midpoint of AB. Prove PM⊥AB, and conclude that P lies on the perpendicular bisector of AB.



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

Exit question 9

A line passes through the midpoint of AB, but it is not stated to be perpendicular to AB. Must every point on it be equidistant from A and B?

A. No; the perpendicular condition is also needed.
B. Yes; midpoint information alone is enough.
C. Yes; all lines through one point coincide.
D. No line can be perpendicular to AB.

Exit question 10

A line is perpendicular to AB but crosses it away from its midpoint. Can it be the perpendicular bisector of AB?

A. No; perpendicular lines cannot intersect.
B. No; it fails the midpoint requirement.
C. Yes; perpendicularity alone is enough.
D. Yes; a segment has many different midpoints.