Geometric objects, segments and midpoints — Teacher answers

Year 7, upper volume • text pp. 79–90 • foundation lessons 40–45

Use the prerequisite checks to choose support, project the worked and guided items, then let learners work on paper. Select supplements or extensions as needed. No learner answers are saved by this presentation.

Worked example 1

AB = 12 cm and M is its midpoint. Find AM and state both parts of the midpoint condition.



Points are shown in the stated order; use the given lengths.

Reference answer

6 cm.

1. M lies on AB and AM = MB.
2. AM is half of AB: 12 ÷ 2 = 6 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

Guided attempt 2

M lies between A and B. AB = 10 cm and AM = 3 cm. Find MB and fill the length relation first.



1. AM + _____ = AB.
2. 3 + MB = _____.
3. MB = _____ cm.

Points are shown in the stated order; use the given lengths.

Reference answer

7 cm.

1. Because M lies between the endpoints, AM + MB = AB.
2. MB = 10 − 3 = 7 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

Prerequisite 3

A segment has two endpoints and does not extend indefinitely beyond them. Is this description correct?

Reference answer

Correct. Its two endpoints bound its finite length.

1. Identify the two endpoints.
2. There is no indefinitely extending direction in a segment.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.

Prerequisite 4

A learner says a ray has two endpoints and extends indefinitely in one direction. Correct the endpoint count.

Reference answer

A ray has one endpoint and extends indefinitely in one direction.

1. The starting point is the only endpoint.
2. A second marked point indicates direction; it is not an endpoint of the ray.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.

Independent practice 5

C lies between A and B. AB = 9 cm and AC = 4 cm. Find CB.



Points are shown in the stated order; use the given lengths.

Reference answer

5 cm.

1. AC + CB = AB.
2. CB = 9 − 4 = 5 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

Independent practice 6

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

Points are shown in the stated order; use the given lengths.

Reference answer

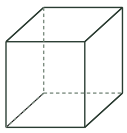
9 cm.

1. AM = MB and AM + MB = 18.
2. AM = 18 ÷ 2 = 9 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

Independent practice 7

How many edges does a cube have? Count each distinct object once.



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

Reference answer

12 edges.

$$12$$

1. Use a complete cube, including the parts behind the visible front faces.
2. There are 12 distinct edges.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.

Independent practice 8

A straight line has no endpoints and extends indefinitely in both directions. Is this description correct?

Reference answer

Correct: no endpoints and two extending directions.

1. Marked points on a line do not become its endpoints.
2. It continues beyond every such point in both directions.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.

Exit question 9

M is the midpoint of AB and AM = 4 cm. Find AB.



Points are shown in the stated order; use the given lengths.

Reference answer

8 cm.

1. The midpoint gives MB = AM = 4 cm.
2. AB = 4 + 4 = 8 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

Exit question 10

A, B, M have coordinates 0, 6, 8 on one line. A learner claims AM + MB = AB merely because they are collinear. Test the claim.



Use the given order and lengths; the sketch is not a measuring scale.

Reference answer

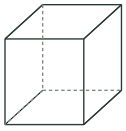
False. AM + MB = 8 + 2 = 10, but AB = 6. M must lie between A and B for that addition relation.

1. M lies outside AB, beyond B.
2. Compute all three distances before comparing.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.

Further practice 11

How many faces does a cube have? Count each distinct object once.



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

Reference answer

6 faces.

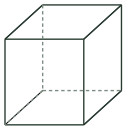
$$6$$

1. Use a complete cube, including the parts behind the visible front faces.
2. There are 6 distinct faces.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.

Further practice 12

How many vertices does a cube have? Count each distinct object once.



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

Reference answer

8 vertices.

$$8$$

1. Use a complete cube, including the parts behind the visible front faces.
2. There are 8 distinct vertices.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.

Further practice 13

M lies between A and B, AM = 5 cm and AB = 13 cm. Find MB.



Points are shown in the stated order; use the given lengths.

Reference answer

8 cm.

1. AM + MB = AB.
2. MB = 13 − 5 = 8 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

Further practice 14

A, B, C are collinear in that order. AB = 3 cm and BC = 7 cm. Find AC.



Use the given order and lengths; the sketch is not a measuring scale.

Reference answer

10 cm.

1. B lies between A and C.
2. AC = AB + BC = 3 + 7 = 10 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

Extension 15

AB = 12 cm, M is its midpoint, and P lies between A and M with AP = 2 cm. Find PM.



Points are shown in the stated order; use the given lengths.

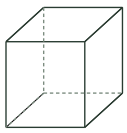
Reference answer

4 cm.

1. AM = 12 ÷ 2 = 6 cm.
2. Since P lies between A and M, PM = AM − AP = 6 − 2 = 4 cm.

- Use the stated order or midpoint condition before adding or halving.
- Give the correct length with its unit.

A cube has six faces with four edges on each face. Why is its edge count not $6 \times 4 = 24$? Find the distinct edge count.



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

Reference answer

Each edge belongs to two faces, so 24 face-edge incidences count every edge twice. The distinct count is 24/2 = 12.

1. Six faces give 24 incidences, not 24 distinct edges.
2. Divide by two because every edge is shared by two faces.

- State the applicable definition or condition accurately.
- Support the conclusion with the given numbers, a check or a concrete counterexample.