

Geometry · Geometric Constructions · Quiz

Common Core G-CO.D.12, G-CO.D.13 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Ten multiple-choice questions check the key ideas of compass and straightedge constructions: bisectors, perpendicular and parallel lines, and inscribed polygons. Four questions include a figure. Each explanation shows why the answer is correct and which mistake to avoid. Read every option before you choose, because the wrong answers use common slips such as confusing the radius with the side length.

GeometryCommon Core: G-CO.D.12 · G-CO.D.13

Questions

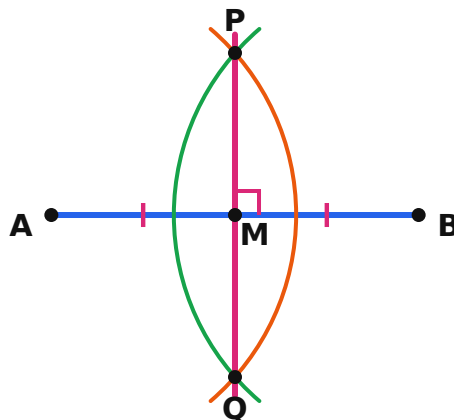
Question 1

Which tool is used to mark a length equal to a given segment without measuring?

- A. Compass
- B. Straightedge
- C. Protractor
- D. Ruler

Question 2

M is the midpoint found by constructing the perpendicular bisector of AB. If $AB = 12 \text{ cm}$, what is AM ?



Perpendicular bisector of AB meeting AB at M.

- A. 12 cm
- B. 3 cm
- C. 6 cm
- D. 24 cm

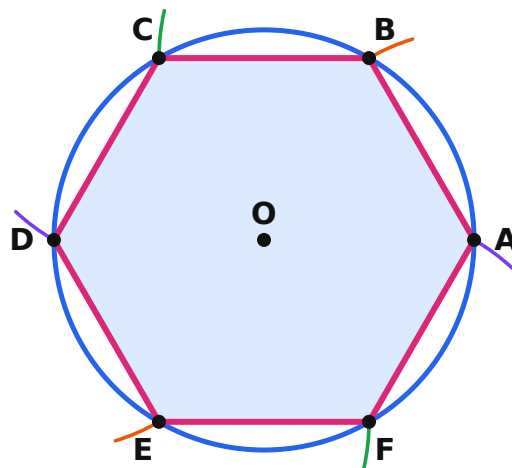
Question 3

Angle ABC measures 78° . After constructing its bisector, what does each half measure?

- A. 78°
- B. 156°
- C. 19.5°
- D. 39°

Question 4

A regular hexagon is inscribed in a circle of radius 9 cm. What is the length of each side?



Regular hexagon inscribed in a circle.

- A. 4.5 cm
- B. 9 cm
- C. 18 cm
- D. 54 cm

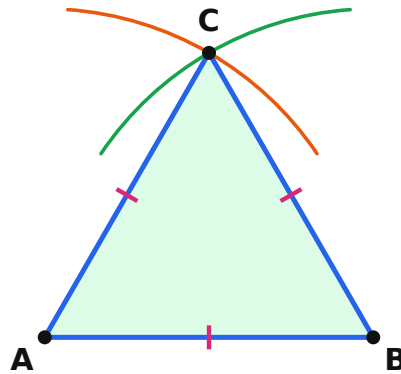
Question 5

Which method constructs a square inscribed in a circle?

- A. Step around the circle six times with the radius
- B. Draw a diameter, then construct its perpendicular bisector
- C. Bisect the radius twice
- D. Draw two equal chords at random

Question 6

Why is triangle ABC equilateral?



Triangle ABC built with arcs centered at A and B.

- A. AC and BC are radii of arcs drawn with width AB
- B. Angle C was bisected with a compass
- C. The compass was opened to half of AB
- D. AB is parallel to a line through C

Question 7

A line through P is constructed parallel to line l by copying an angle. Which angle pair is copied?

- A. Vertical angles
- B. A linear pair
- C. Corresponding angles
- D. Complementary angles

Question 8

Every point on the perpendicular bisector of AB is

- A. closer to A than to B
- B. twice as far from A as from B
- C. the same distance from A and from B
- D. exactly at distance AB from A

Question 9

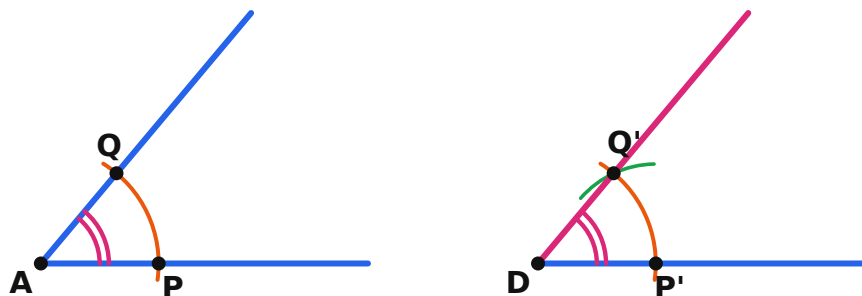
What is the measure of each central angle of an inscribed regular hexagon?

- A. 30°
- B. 90°
- C. 120°

D. 60°

Question 10

In copying an angle, which compass width is used to mark the last arc?



Copying angle A to a new angle at D.

- A. The radius AP
- B. The distance PQ
- C. The distance AD
- D. Any convenient width

Answer key

1. **A** – A compass keeps its width fixed and copies the length. A straightedge only draws lines, and measuring tools are not allowed.
2. **C** – The perpendicular bisector passes through the midpoint, so AM is half of AB: $12 / 2 = 6$ cm.
3. **D** – A bisector divides the angle into two equal parts: $78 / 2 = 39$. Doubling to 156 is a common slip.
4. **B** – The side of the inscribed regular hexagon equals the radius, 9 cm. The perimeter, not the side, is 54 cm.
5. **B** – A diameter and its perpendicular bisector give four points that are 90 degrees apart, which are the vertices of a square.
6. **A** – Both arcs use the width AB, so $AC = AB$ and $BC = AB$. All three sides are equal.
7. **C** – Copying an angle to the same position at P creates congruent corresponding angles, which proves the lines are parallel.
8. **C** – The perpendicular bisector is the set of points equidistant from the two endpoints.
9. **D** – Six equal central angles make 360, and $360 / 6 = 60$. The value 120 is the interior angle of the hexagon.
10. **B** – The last arc copies the distance between P and Q on the original angle. The radius AP was already used for the first two arcs.

Remember:

- Standards G-CO.D.12 and G-CO.D.13 cover making formal constructions and inscribing regular polygons.
- The compass copies lengths; the straightedge only draws lines through two points and is never used to measure.
- The perpendicular bisector of a segment is built with equal arcs wider than half the segment, centered at both endpoints.
- A regular hexagon inscribed in a circle has side length equal to the radius.
- Joining every other vertex of the hexagon gives an equilateral triangle; perpendicular diameters give a square.