Coordinate Geometry and Geometry: Practice Questions with Answers

Class 10 Maths · Units III and IV · Important board-style questions

Name: _____ Class / Section: _____ Date: _____

HOW TO USE THIS SHEET

Try each question on your own first, then check the answer. Marks shown follow the CBSE paper pattern. **Topics covered:** Distance and Section Formulas, Triangles (BPT and Similarity), Circles (Tangents).

Q1 **Find the distance between the points A(−3, 4) and B(5, −2).** **[2 marks]**

ANSWER

Distance = $\sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2]}$

AB = $\sqrt{[(5 + 3)^2 + (-2 - 4)^2]} = \sqrt{[8^2 + (-6)^2]} = \sqrt{(64 + 36)} = \sqrt{100} = 10$

Final Answer: AB = 10 units.

Q2 **Find a point on the x-axis which is equidistant from the points (2, −5) and (−2, 9).** **[3 marks]**

ANSWER

Let the point on the x-axis be P(x, 0). Let A(2, −5) and B(−2, 9). Then PA = PB, so $PA^2 = PB^2$.

$(x - 2)^2 + (0 + 5)^2 = (x + 2)^2 + (0 - 9)^2$

$x^2 - 4x + 4 + 25 = x^2 + 4x + 4 + 81$

$-4x + 29 = 4x + 85$, so $-8x = 56$ and $x = -7$.

Check: $PA^2 = 81 + 25 = 106$ and $PB^2 = 25 + 81 = 106$ ✓

Final Answer: The required point is (−7, 0).

Q3 **Find the coordinates of the point which divides the line segment joining A(4, −3) and B(8, 5) internally in the ratio 3 : 1.** **[3 marks]**

ANSWER

Section formula: $P = [(mx_2 + nx_1)/(m + n), (my_2 + ny_1)/(m + n)]$, with m = 3 and n = 1.

$x = (3 \times 8 + 1 \times 4)/(3 + 1) = 28/4 = 7$

$y = (3 \times 5 + 1 \times (-3))/(3 + 1) = 12/4 = 3$

Final Answer: The required point is (7, 3).

Q4 **The centre of a circle is O(2, −3) and A(1, 4) is one end of a diameter AB. Find the coordinates of B.** **[2 marks]**

ANSWER

The centre is the midpoint of the diameter. Let B = (x, y).

(1 + x)/2 = 2, so x = 3.

(4 + y)/2 = −3, so y = −10.

Final Answer: B = (3, −10).

Q5 **In △ABC, DE ∥ BC, where D lies on AB and E lies on AC. If AD = x, DB = x − 2, AE = x + 2 and EC = x − 1, find the value of x.** **[3 marks]**

ANSWER

By the Basic Proportionality Theorem: AD/DB = AE/EC

x/(x − 2) = (x + 2)/(x − 1)

x(x − 1) = (x + 2)(x − 2)

$x^2 - x = x^2 - 4$, so x = 4.

Check: AD/DB = 4/2 = 2 and AE/EC = 6/3 = 2 ✓

Final Answer: x = 4.

Q6 **The areas of two similar triangles are 64 cm² and 121 cm². If a side of the smaller triangle is 5.6 cm, find the corresponding side of the larger triangle.** **[3 marks]**

ANSWER

The ratio of areas of similar triangles = (ratio of corresponding sides)².

(side of smaller/side of larger)² = 64/121

So side of smaller/side of larger = 8/11.

5.6/side of larger = 8/11, so side of larger = 5.6 × 11/8 = 7.7 cm.

Final Answer: The corresponding side is 7.7 cm.

Q7 **PQ is a tangent to a circle with centre O at the point P. If the radius OP = 5 cm and OQ = 13 cm, find the length of PQ.** **[2 marks]**

ANSWER

The tangent is perpendicular to the radius at the point of contact, so ∠OPQ = 90°.

In right-angled △OPQ: $PQ^2 = OQ^2 - OP^2 = 13^2 - 5^2 = 169 - 25 = 144$

PQ = 12 cm.

Final Answer: PQ = 12 cm.

Q8 **Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.** **[3 marks]**

ANSWER

Given: A circle with centre O and a tangent XY touching the circle at P. **To prove:** OP ⊥ XY.

Proof: Take any point Q on XY other than P, and join OQ.

A tangent touches the circle only at P, so Q lies outside the circle. Hence OQ is greater than the radius OP.

This is true for every point Q on XY other than P. So OP is the shortest distance from O to the line XY.

The shortest distance from a point to a line is the perpendicular distance. Hence OP ⊥ XY.

Final Answer: The tangent is perpendicular to the radius at the point of contact.

Q9 **Two tangents PA and PB are drawn from an external point P to a circle with centre O. If ∠APB = 80°, find ∠POA.** **[3 marks]**

ANSWER

OA ⊥ PA and OB ⊥ PB, so ∠OAP = ∠OBP = 90°.

In quadrilateral OAPB: ∠AOB = 360° − 90° − 90° − 80° = 100°.

△OAP ≅ △OBP (RHS), so OP bisects ∠AOB.

∠POA = 100°/2 = 50°.

Final Answer: ∠POA = 50°.

BEFORE YOU CLOSE THIS SHEET

For geometry proofs, always write Given, To Prove and Proof, and draw a neat labelled diagram. Both earn marks.