



Class 9 Maths – Chapter 5

Exercise 5.1 – Important Questions with Answer Key

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Exercise 5.1 is on **constructing circumcircles and understanding the position of the circumcentre**. The textbook contains 4 questions followed by 2 “Think, Draw and Infer” questions.



Exercise 5.1

1. Construct a triangle ABC

Given:

- $AB = 5 \text{ cm}$
- $\angle A = 70^\circ$
- $\angle B = 60^\circ$

Draw the circumcircle of $\triangle ABC$.

Question: Is the centre inside or outside the triangle?



Answer:

$$\angle C = 180^\circ - 70^\circ - 60^\circ$$

$$\angle C = 50^\circ$$

All three angles are less than 90° , so $\triangle ABC$ is an **acute-angled triangle**.

Therefore, the **circumcentre lies inside the triangle**. 

2. Construct a triangle ABC

Given:

- $AB = 5 \text{ cm}$
- $\angle A = 100^\circ$
- $AC = 4 \text{ cm}$

Draw the circumcircle of $\triangle ABC$.

Question: Is the centre inside or outside the triangle?

✓ **Answer:**

Since $\angle A = 100^\circ$, the triangle is **obtuse-angled**.

Therefore, the **circumcentre lies outside the triangle**. ★

3. Construct a triangle ABC

Given:

- $AB = 6 \text{ cm}$
- $BC = 7 \text{ cm}$
- $CA = 7 \text{ cm}$

Draw the circumcircle of $\triangle ABC$.

Let the circumcentre be **O**.

Measure:

- OA
- OB
- OC

✓ **Answer:**

Since O is the circumcentre, it is **equidistant from all three vertices**.

Therefore:

$$OA = OB = OC$$

For this particular triangle, the circumradius is approximately:

$$OA = OB = OC \approx 7.75 \text{ cm}$$

 The exact value is:

$$49/(2\sqrt{10}) \text{ cm}$$

The measured values in your construction should be approximately equal.

4. ★ Least possible radius

What is the least possible radius of a circle through two points **A** and **B**?

✓ **Answer:**

The smallest circle passing through A and B has **AB as its diameter**.

Therefore:

$$\text{Least radius} = AB/2$$

★ **Answer:** $AB/2$



Think, Draw and Infer

1. 📍 Three collinear points

A, B and C are three collinear points.

Can you find a point P such that:

$$PA = PB = PC?$$

What can you say about the perpendicular bisectors of AB and BC?

Can a circle pass through three collinear points?

✓ **Answer:**

✗ There is **no point P** such that:

$$PA = PB = PC$$

for three distinct collinear points.

The perpendicular bisectors of **AB** and **BC** are **parallel**, so they do not meet at a common point.

Therefore:

✗ No circle can pass through three distinct collinear points.

Also, a straight line cannot cut a circle at three distinct points.

2. ● Circumcircle of $\triangle ABC$

The circumcircle of a given $\triangle ABC$ is drawn.

Can there be other triangles congruent to $\triangle ABC$ that share the same circumcircle?

✓ **Answer:**

Yes.

Different triangles congruent to $\triangle ABC$ can be formed using points on the **same circumcircle**, depending on the placement of their vertices.

Quick Answer Key

Question	Answer
1	Circumcentre inside the triangle
2	Circumcentre outside the triangle
3	$OA = OB = OC \approx 7.75 \text{ cm}$
4	Least radius = $AB/2$
Think & Draw 1	No such P; perpendicular bisectors are parallel ; no circle through 3 collinear points
Think & Draw 2	Yes , other congruent triangles can share the same circumcircle

📌 **Exam Focus:** Questions **1, 2, 3 and 4** are particularly useful because they test the key ideas about the **circumcircle, circumcentre, acute/obtuse triangles, and minimum radius**. The textbook establishes that the circumcentre of an acute triangle is inside, of an obtuse triangle is outside, and of a right triangle is at the midpoint of the hypotenuse.

