MAHARASHTRA BOARD · CLASS 10 · MATHS PART 2 GEOMETRY

# Maharashtra Board Class 10 Maths Part 2 Geometry Important Questions 2027

38 question patterns that repeated across past papers · the years show every time each was asked

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## Similarity

### 1. Find the ratio of areas of two similar triangles given the ratio of correspondin

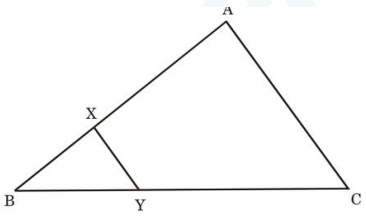
Asked 3× · Board 2024, Board 2025, Board 2026 · 1 marks

The ratio of corresponding sides of similar triangles is 3 : 5, then find the ratio of their areas.

### 2. Find an unknown side using similar triangles (corresponding sides in proportion)

Asked 3× · Board 2022, Board 2025, Board 2026 · 3 marks

In the given figure, seg XY parallel side AC. If 2AX = 3BX and XY = 9, complete the activity to find the value of AC. Activity: 2AX = 3BX; AX/BX = 3/2; (AX + BX)/BX = (3 + 2)/2; AB/BX = 5/2; triangle BCA ~ triangle BYX (AA test of similarity); BA/BX = AC/XY (corresponding sides); 5/2 = AC/9; AC = 22.5.



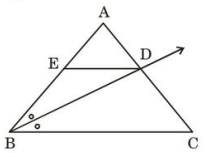

Activity :

### 3. Prove a proportionality relation using the angle bisector property together with

Asked 2× · Board 2024, Board 2026 · 3 marks

In the given figure, in triangle ABC ray BD bisects angle ABC, A - D - C, seg ED perpendicular to side BC, A - E - B, then to prove that AB/AE = BC/EB complete the activity. Activity: In triangle ABC, ray BD bisects angle B, AB/BC = AD/DC (I) (Angle bisector theorem); In triangle ABC, seg ED parallel side BC, AE/EB = AD/DC (II); from (I) and (II) AB/AE = BC/EB.

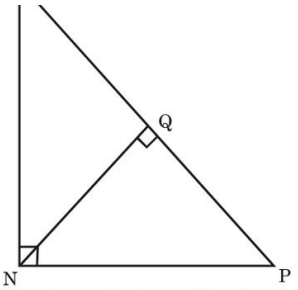
following activity.



**4. Find the altitude to the hypotenuse as geometric mean of the two segments of the**

Asked 2× · Board 2024, Board 2025 · 1/2 marks

In the given figure angle MNP = 90 degrees, seg NQ perpendicular to seg MP, MQ = 9, QP = 4, find NQ.




(3) Angle made by a line with the positive direction of X-axis is 30°. Find slope of that line.

**5. Find a corresponding angle of two similar triangles using the equality of corres**

Asked 2× · Board 2022, Board 2025 · 1 marks

If triangle ABC ~ triangle DEF, m angle B = 60 degrees, then m angle E = ..... (A) 30 degrees (B) 60 degrees (C) 90 degrees (D) 45 degrees

## Pythagoras Theorem

**6. Identify which set of numbers forms a Pythagorean triplet**

Asked 4× · Board 2024, Board 2025, Board 2026 · 1 marks

Out of the following which is a Pythagorean triplet? (a) (1, 5, 10) (b) (5, 12, 13) (c) (2, 3, 4) (d) (5, 5, 2)

**7. Find the diagonal of a square given its side (45-45-90 relation, diagonal = side**

Asked 2× · Board 2025, Board 2026 · 1 marks

Find the diagonal of a square whose side is 5 cm.

**8. Find the side of a square given its diagonal (45-45-90 relation, diagonal = side**

Asked 2× · Board 2024, Board 2026 · 1 marks

Find the side of a square if its diagonal is 10 root 2 cm.

**9. Find the diagonal of a rectangle given length and breadth using the Pythagoras t**

Asked 2× · Board 2023, Board 2026 · 2 marks

Find the length of diagonal of a rectangle whose length is 35 cm and breadth is 12 cm.

## Circle

**10. Find the distance between centres of two circles touching each other externally/**

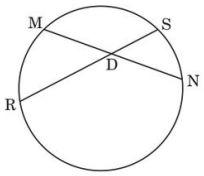
Asked 4× · Board 2024, Board 2025, Board 2026 · 1 marks

Two circles having radii 4 cm and 5 cm touch each other internally. Then the distance between the centres is ..... (A) 4 cm (B) 5 cm (C) 1 cm (D) 9 cm

### 11. Find an unknown chord segment using the internal intersecting-chords theorem

Asked 3× · Board 2023, Board 2025, Board 2026 · 1/2 marks

In the given figure, chord MN and chord RS intersect at point D. If RD = 15, DS = 4, MD = 8, find DN.




### 12. Prove that opposite angles of a cyclic quadrilateral are supplementary

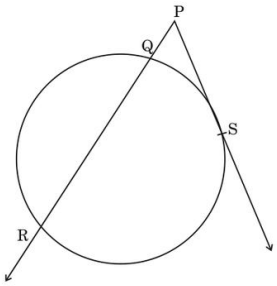
Asked 3× · Board 2022, Board 2024, Board 2026 · 3 marks

Prove that, opposite angles of a cyclic quadrilateral are supplementary.

### 13. Find the tangent segment length from an external point using the tangent-secant

Asked 2× · Board 2025, Board 2026 · 2 marks

In the given figure, seg PS is a tangent segment, line PR is a secant. If PQ = 3.6, QR = 6.4, find PS. Activity: $PS^2$ = PQ x PR (Tangent secant segment theorem) = PQ x [PQ + QR] = 3.6 x [3.6 + 6.4] = 3.6 x 10; $PS^2$ = 36; PS = 6.




### 14. Prove the tangent segment theorem / tangents from an external point are congruen

Asked 2× · Board 2025, Board 2026 · 3 marks

Prove that: The tangent segments drawn from an external point to the circle are congruent.

### 15. Find angles formed by a tangent, chord and diameter using tangent-radius perpend

Asked 2× · Board 2024, Board 2026 · 3 marks

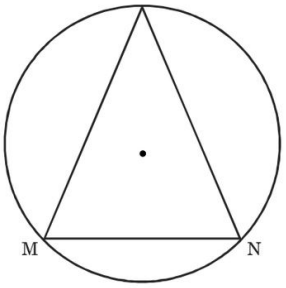
AB is a chord of a circle with centre O. AC is a diameter of the circle. Line AT is a tangent at A. Write the answers: (a) Draw the figure using the given information. (b) Find the measure of angle CAT. (c) Find the measure of angle ABC.

### 16. Find an inscribed angle given the measure of its intercepted arc (or vice versa)

Asked 2× · Board 2024, Board 2025 · 1 marks

In the given figure, m(arc MN) = 70 degrees, find angle MLN (inscribed angle subtending arc MN).

(2)

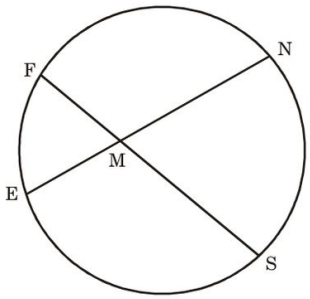



In the above figure, $m$(arc MN) = 70°, find ∠MLN.

### 17. Find the angle between two secants/chords from the intercepted arcs (half the di

Asked 2× · Board 2024, Board 2025 · 2 marks

In the given figure, m(arc NS) = 125 degrees, m(arc EF) = 37 degrees. Find m angle NMS (angle formed by two secants meeting outside the circle).

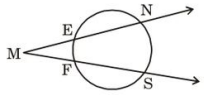



### 18. Find the angle between two secants meeting outside the circle as half the differ

Asked 2× · Board 2022, Board 2026 · 2 marks

In the given figure, chord EN and chord FS intersect each other at point M in the exterior of the circle. If m(arc NS) = 125 degrees, m(arc EF) = 37 degrees, then complete the activity to find angle NMS. Activity: m angle NMS = 1/2 [m(arc NS) - m(arc EF)] = 1/2 [125 - 37] = 1/2 (88) = 44 degrees.

to find ∠NMS.




## Geometric Constructions

### 19. Construct a triangle similar to a given triangle with a given scale factor

Asked 7× · Board 2022, Board 2023, Board 2024, Board 2025, Board 2026 · 3/4 marks

triangle ABC ~ triangle ADE. In triangle ABC, AB = 6.3 cm, angle CAB = 50 degrees, AC = 5.6 cm and AB/AD = 7/5. Construct triangle ADE.

### 20. Construct tangents to a circle from an external point at a given distance

Asked 3× · Board 2024, Board 2025, Board 2026 · 3 marks

Draw a circle with centre O and radius 3.5 cm, take a point P at a distance 5.7 cm from the centre. Draw tangents to the circle from point P.

### 21. Construct tangents at the endpoints of a given chord of a circle

Asked 2× · Board 2023, Board 2025 · 3 marks

Draw a circle with centre O of radius 3.4 cm. Draw a chord MN of length 5.7 cm in it. Construct tangents at point M and N to the circle.

## Coordinate Geometry

### 22. Find the slope of a line making a given angle with the positive X-axis

Asked 5× · Board 2024, Board 2025, Board 2026 · 1 marks

Angle made by the line with the positive direction of X-axis is 30 degrees. Find slope of the line.

### 23. Find the midpoint of the segment joining two given points

Asked 4× · Board 2023, Board 2025, Board 2026 · 2/3 marks

If P is the midpoint of segment joining the points A(-4, 2) and B(6, 2), then complete the activity to find the co-ordinates of point P. Activity: (x1, y1) = (-4, 2), (x2, y2) = (6, 2); by midpoint formula x = (x1 + x2)/2 = 2/2 = 1, y = (y1 + y2)/2 = 4/2 = 2; co-ordinates of midpoint are (1, 2).

### 24. Find coordinates of the point dividing a segment in a given ratio (section formu

Asked 3× · Board 2022, Board 2025, Board 2026 · 3 marks

Find the co-ordinates of point P, if P divides the line segment joining the points A(-1, 7) and B(4, -3) in the ratio 2 : 3.

### 25. Find the slope of a line passing through two given points

Asked 3× · Board 2024, Board 2025 · 1/2 marks

Find the slope of the line passing through the points A(2, 3) and B(4, 7).

### 26. Find the distance between two given points using the distance formula

Asked 2× · Board 2023, Board 2026 · 1/2 marks

Find the distance between the points P(-1, 1) and Q(5, -7).

### 27. Determine whether three given points are collinear

Asked 2× · Board 2024, Board 2025 · 2/3 marks

Verify, whether points A(1, -3), B(2, -5) and C(-4, 7) are collinear or not.

### 28. Show that three given points are collinear

Asked 2× · Board 2023, Board 2024 · 2/3 marks

Show that points P(-2, 3), Q(1, 2), R(4, 1) are collinear.

### 29. Determine coordinates of a point given a segment is parallel to an axis (same ab

Asked 2× · Board 2022, Board 2024 · 1 marks

Seg AB is parallel to Y-axis and co-ordinates of point A are (1, 3), then the co-ordinates of point B are ..... (A) (3, 1) (B) (5, 3) (C) (3, 0) (D) (1, -3)

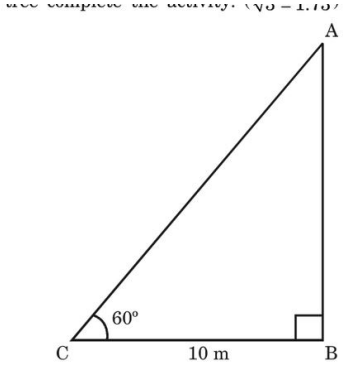
## Trigonometry

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### 30. Find a height/length using a single angle of elevation/depression and a given di

Asked 4× · Board 2023, Board 2025, Board 2026 · 2/3 marks

An observer at a distance of 10 m from a tree looks at the top of the tree, the angle of elevation is 60 degrees. To find the height of the tree complete the activity. (root 3 = 1.73) Activity: AB = h = height of tree, BC = 10 m; angle of elevation = angle BCA = 60 degrees; tan theta = AB/BC; tan 60 = AB/BC = root 3; AB = BC x root 3 = 10 root 3 = 10 x 1.73.




**Activity :**

### 31. Find one trigonometric ratio from another using a Pythagorean identity (sin$^2$ +

Asked 3× · Board 2022, Board 2025, Board 2026 · 2 marks

If sin theta = 20/29, then complete the activity to find cos theta. Activity: sin$^2$ theta + cos$^2$ theta = 1; cos$^2$ theta = 1 - sin$^2$ theta; cos$^2$ theta = 1 - 400/841; cos$^2$ theta = 441/841; taking square roots, cos theta = 21/29.

### 32. Find one trigonometric ratio from another using a Pythagorean identity (1 + tan^

Asked 2× · Board 2024, Board 2026 · 2 marks

If sec theta = 25/7, find the value of tan theta. Solution: 1 + tan$^2$ theta = sec$^2$ theta; 1 + tan$^2$ theta = (25/7)$^2$; tan$^2$ theta = 625/49 - 49/49 = 576/49; tan theta = 24/7.

### 33. Prove a given trigonometric identity

Asked 3× · Board 2022, Board 2023 · 2/3 marks

Show that cot theta + tan theta = cosec theta x sec theta. Solution: L.H.S. = cot theta + tan theta = cos theta/sin theta + sin theta/cos theta = (cos$^2$ theta + sin$^2$ theta)/(sin theta x cos theta) = 1/(sin theta x cos theta) = 1/sin theta x 1/cos theta = cosec theta x sec theta = R.H.S.

## Mensuration

### 34. Find the volume of a solid (cube/cuboid/cylinder/cone/sphere) given its dimensio

Asked 5× · Board 2024, Board 2025, Board 2026 · 1/2 marks

If the side of the cube is 5 cm, then the volume of that cube is ..... (A) 10 cm3 (B) 100 cm3 (C) 125 cm3 (D) 25 cm3

### 35. Find the surface area of a solid (sphere/cone/cylinder/cube/cuboid) given its di

Asked 4× · Board 2023, Board 2024, Board 2025 · 2 marks

Find surface area of a sphere of radius 7 cm.

### 36. Find the area of a sector given radius and arc length (A = l x r / 2)

Asked 3× · Board 2024, Board 2026 · 1/2 marks

Radius of a sector of a circle is 35 cm and length of its arc is 22 cm. What is the area of the sector? (a) 285 cm2 (b) 185 cm2 (c) 385 cm2 (d) 85 cm2

**37. Find how many small solids can be recast by melting a larger solid (equal volume**

Asked 2× · Board 2025, Board 2026 · 3/4 marks

Find the number of coins of 2.2 cm diameter and 0.2 cm thick, that can be made by melting a metallic right circular cylinder of height 0.2 m and diameter 8.8 cm.

**38. Find the slant height of a cone from its radius and perpendicular height ($l^2$ =**

Asked 2× · Board 2023, Board 2025 · 1 marks

If radius of cone is 5 cm and its perpendicular height is 12 cm, then the slant height is ..... . (A) 17 cm (B) 4 cm (C) 13 cm (D) 60 cm

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