



MATHS

BOOKS - CALCUTTA BOOK HOUSE MATHS (BENGALI ENGLISH)

CONSTRUCTION OF CIRCUMCIRCLES AND INCIRCLE OF A TRIANGLE

Example

1. find the value of p from the polynomial $x^2 + 3x + p$ if one of the zeroes of the polynomial is 2



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2. Given that $PQ = 7.5$

$$\angle QOP = 45^\circ, \angle PQR = 75^\circ, \angle QPS = 60^\circ, \angle PQS = 60^\circ$$

Construct the triangle PQR and PQS in such a way that the points R and S lie on the same side of PQ . Then by drawing the circumcircle of $\triangle PQR$ write the position of the points S within, on and outside the circumcircle. Also explain your answer.



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3. Given that $AB = 5$ cm

$$\angle BAC = 30^\circ, \angle ABC = 60^\circ, \angle BAD = 45^\circ, \angle ABD = 45^\circ$$

Construct two triangles $\triangle ABC$ and $\triangle ABD$ in such a way that the point C and D lie on opposite side of AB . By drawing the circumcircle of $\triangle ABC$ write the position of the

point D with respect to the circumcircle . Also state what other characteristics you are observing here.

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4. Given that $AB = 4$ cm , $BC = 7$, $CD = 4$ cm , $\angle ABC = 60^\circ$, $\angle BCD = 60^\circ$. Construct the quadrilateral ABCD. The construct the circumcircle of $\triangle ABC$ and also state what other characteristics you observe.

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5. Given that $PQ = 4$ cm , $QR = 6$ cm . Construct the rectangle PQRS . Also draw the diagonals of the rectangle

and without drawing the circumcircle write the position of the centre of the circumcircle of ΔPQR and find the length of circumradius. After all by drawing the circumcircle of ΔPQR verify your answer .

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6. Does the polynomial $a^4 + 4a^2 + 5$ have real zeroes ?

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7. find the quadratic polynomials if it's zeroes are 0 and $\sqrt{5}$

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8. find the value of x in the polynomial $2a^2 + 2xa + 5a + 10$ if $(a + x)$ is one of its factors.

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9. If α and β zeroes of the quadratic polynomial $x^2 - 6x + y$. find the value of y if $3\alpha + 2\beta = 20$

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10. Find the area of the sector of a circle with radius 4cm and angle 30° also find the area of the corresponding major sector (use $\pi = 3.14$)

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11. find the values of k for each of the following quadratic equations, so they have equal roots: $2x^2 + kx + 3 = 0$

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12. find the values of k for each of the following quadratic equations, so they have equal roots: $kx(x - 2) + 6 = 0$

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13. The length of two sides of a triangle are 7.6 cm and 6 cm and the internal angle between these two sides is 75° .

Construct the triangle and then by drawing the incircle of this triangle determine the inradius of it.

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14. The length of two adjacent sides of the right angle of a right - angled triangle are 7 cm and 9 cm . Construct the right - angled triangle . Also construct the incircle of this triangle [Given construction signs only].

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15. Construct a right-angled triangle , the hypotenuse of which is 11.4 cm and the length of another side is 9 cm .

Then by constructing the incircle of this triangle find the inradius of it.

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16. The base of an isosceles triangle is 10 cm and each of the equal angles is 45° . By drawing this triangle, construct the incircle of it and hence determine its inradius. (Given construction signs only) .

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17. Construct an equilateral triangle of sides 7 cm each. By constructing its circumradius and inradius or not.

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18. The base of an isosceles triangle is 8.4 cm and the length of each of its equal sides is 9 cm. Construct this triangle and then by drawing its incircle, determine its inradius. (Give construction signs only).

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19. The two adjacent sides of the right angle of a right-angled triangle are 3 cm and 4 cm. Construct the triangle and then by drawing its incircle, determine the inradius of this triangle. (Given construction signs only).

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20. The length of the hypotenuse of a right - angled triangle is 13 cm and its another side 5 cm. Construct the triangle and then by drawing the incircle of this triangle determine its inradius .

(Given construction signs only).

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21. There sides of a triangle are 5 cm , 6 cm and 9 cm respectively . Construct the trinagle and then they by drawing its incircle , determine the inradius of this triangle .

(Given construction signs only).

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Exercise 7 1 Multiple Choice Question

1. The point of intersection in which the perpendicular bisector of these sides of a triangle intersect each other is called

A. incentre

B. circumcentre

C. centriod

D. orthocentre

Answer: B



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2. The perpendicular bisectors of the three side of an acute triangle intersect each other

- A. outside the triangle
- B. at any vertex of the triangle
- C. inside the triangle
- D. on the greatest side of the trinagle

Answer: C



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3. The perpendicular bisector of the three sides of a right - angled triangle intersect each other

A. at right angular point

B. outside the right- angled triangle

C. inside the right - angled triangle

D. at the mid-point of the hypotenuse of the right -
angled triangle

Answer: D



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4. If two adjacent sides of the right angled trinagle be 11 cm 4.5 cm respectively, them the length of circumradius of this triangle will be

A. 5.96 cm

B. 6 cm

C. 5 cm

D. 6.94 cm

Answer: A



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Exercise 7 1 Fill In The Blanks

1. If the incentre , circumcentre and centroid of a triangle be the same point , the triangle will be an _____ triangle.



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2. The circle which passes through three vertices of a right triangle is called the _____ of the triangle.

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Exercise 7 1 Long Answer Type Question

1. Draw a triangle the sides of which are 5 cm, 7 cm and 8 cm. Then construct the circumcircle of the triangle.

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2. Construct an isosceles triangle, the base of which is 5.6 cm and the length of each equal side is .

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3. Construct the circumcircle of a give acute triangle .

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4. Construct the following according to the give measure and the also draw their circumcircle .

The length of the three sides of the trinagle are 6 cm , 8 cm , 10 cm .

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5. Construct the following according to the give measure and the also draw their circumcircle .

The length of any two sides of the triangle are 4.5 cm and 6.5 cm and their internal angle is 60° .

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6. Construct the following according to the given measure and also draw their circumcircle .

One of the sides is 8.2 cm and the two adjacent angles of the side are 30° and 45° .

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7. Construct the following according to the given measure and also draw their circumcircle .

An equilateral triangle the length of its side being 9 cm each

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8. Construct the following according to the given measure and also draw their circumcircle .

An isosceles triangle , the length of whose base is 5.6 cm and each of the angles adjacent to that side is 75° .

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9. Construct the following triangle according to the given measure and also draw their circumcircles .

A right - angled triangle , the length of whose two adjacent sides of the right are 6 cm and 8 cm .

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10. Construct the following trinagle according to the given measure and the also draw their circumcircles .

A right - angled triangle , the hypotenus of which I 13 cm and any other side is 4 cm .

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11. Construct an isoscles triangle , the base of which is 7 cm and the vertical angle is 120° without the help of a

protractor . Then draw the circumcircle of that triangle .

(Given construction signs only).



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12. Construct a righted - triangle triangle , the length of whose two adjacent sides of right - angle are 3 cm and 4 cm . Also construct the cirumcircle fo this trinagle (Give construction signs only).



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13. Constrcut an equilateral triangle the length of whose sides is 5.6 cm each. Also construct the circumcircle of this triangle . (Given construction signs only).



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14. Construct an isosceles triangle, the length of the base of which is 5.6 cm and the two adjacent angles of this base is 75° each. Also construct the circumcircle of this triangle. (Give construction signs only).



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Exercise 7 2

1. The base of an isosceles triangle ABC is 10 cm and each of the equal angles is 45° . Construct the triangle and also construct its incircle. (Given construction sign only).



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2. The length of two sides of a triangle are 7.4 cm and 6 cm and their internal angle is 60° . Construct the triangle, at first and then also construct its incircle. (Given construction signs only).



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3. The length of two sides of a triangle are 5 cm and 8 cm and their internal angle is 45° . By drawing the triangle, construct its incircle. (Given construction signs only).



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4. Construct an isosceles right - angled triangle . (Given construction signs only).

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5. Construct a right- angled triangle of which the two adjacent sides of the right angle are 8 cm and 10 cm .
Construct the incircle the incircle of this triangle.

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6. Construct the incircle of the triangle, the side of which are 4 cm, 6 cm and 8cm .

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7. Construct the incircle of the triangle, the sides of which are 8 cm , 10 cm , and 12 cm.

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8. Construct an isosceles triangle , the base of which is 10 cm the length of each of its equal sides is 8 cm . Also construct the incircle of this triangle .

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9. Construct an equilateral triangle of sides 8 cm each. Also construct the incircle of this triangle . (Given construction using only).

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10. Construct an isosceles triangle , the base of which is 8 cm and the vertical angl is 120° . Construct the incircle of this triangle without the help of any protractor. (Given construction signs only).

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