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# MATHS

# BOOKS - KALYANI MATHS (ASSAMESE ENGLISH)

# ELEMENTARY TRIGONOMETRY

## Example

**1.** ABC is a right angle triangle where angleC=90º . If AB=30 cm, BC =18 cm then find

(a) sinA, (b) secA, (c) cos B (d) cosec B, (e)cotB, (f) tanA

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**2.** ABC is a right angle triangle right angled at C. If cosec A = $\sqrt{5}$ . Find the other trigonometrical ratios.

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**3.** A and P are two acute angles of two right angled triangles ABC and PQR. If sinA=sinP, prove that cot A= cot P

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**4.** A and P are two acute angles of two right angled triangles ABC and PQR. If sinA=sinP, prove that A=P

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**5.** If a line drawn parallel to one side of an acute angle triangle to intersect the other two sides at two distinct points ,then using trigonometric ratios prove that the other two sides are divided in the same ratio.

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**6.** If in two acute angled triangles corresponding angles are equal ,then using trigonometric ratios prove that the corresponding sides are in the same ratio.

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**7.** In $\triangle$ ABC,right-angled at B ,if tan A= $1/\sqrt{3}$, find the value of

$\sin A \cos C + \cos A \sin C$

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**8.** In triangle ABC,right-angled at B,if tanA=$1/\sqrt{3}$,find the value of ,

cosAcosC-sinAsinC

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**9.** If (tanA-tanB)=x and (cotB-cotA)=y ,then cot(A-B)

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**10.** If tan A= $\frac{5}{2}$ prove the following

$3\tan^2 A - 3\sec^2 A + 4 = 1$

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**11.** ABC is a right angle triangle right angled at C. If AC =3 and AB:BC = 13:5, then find sinA and tanB.

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**12.** ABC is a right angle triangle right angled at C. If sin A = $\frac{3}{5}$ find tanB.

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Exercise

**1.** ABC is a right angled triangle where $\angle B = 90^\circ$. If AB=15 cm,BC= 8 cm then find sin C.

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**2.** ABC is a right angled triangle where $\angle B = 90^\circ$. If AB=15 cm,BC= 8 cm then find tan C .

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**3.** ABC is a right angled triangle where $\angle B = 90^\circ$. If AB=15 cm,BC= 8 cm then find sec C.

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**4.** ABC is a right angled triangle where $\angle B = 90^\circ$. If AB=15 cm,BC= 8 cm then find cos A.

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**5.** ABC is a right angled triangle where $\angle B = 90^\circ$. If AB=15 cm,BC= 8 cm then find cosec A.

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**6.** ABC is a right angled triangle where $\angle B = 90^\circ$. If AB=15 cm,BC= 8 cm then find cot A.

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**7.** ABC is right angled triangle right angled at C. if tan A = 5/12, find the other trigonometric ratios.

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**8.** A and P are two acute angles of two right angled triangle ABC and PQR. If cos A= cos P proved that tan A = tan P

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**9.** A and P are two acute angles of two right angled triangle ABC and PQR. If cos A= cos P proved that A = P.

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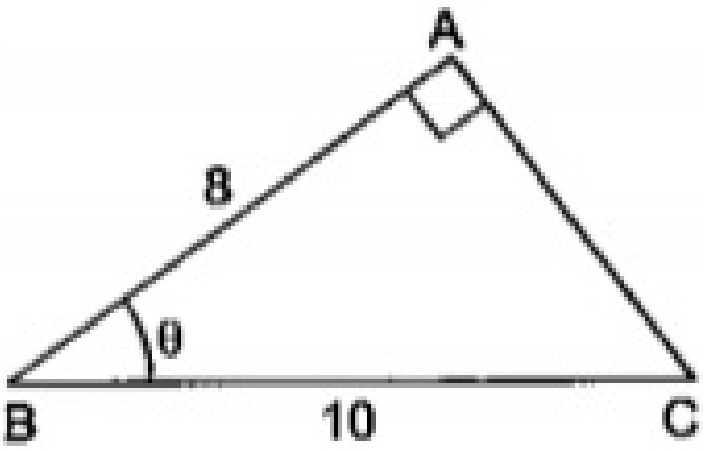
**10.** Find $\sin\theta$.



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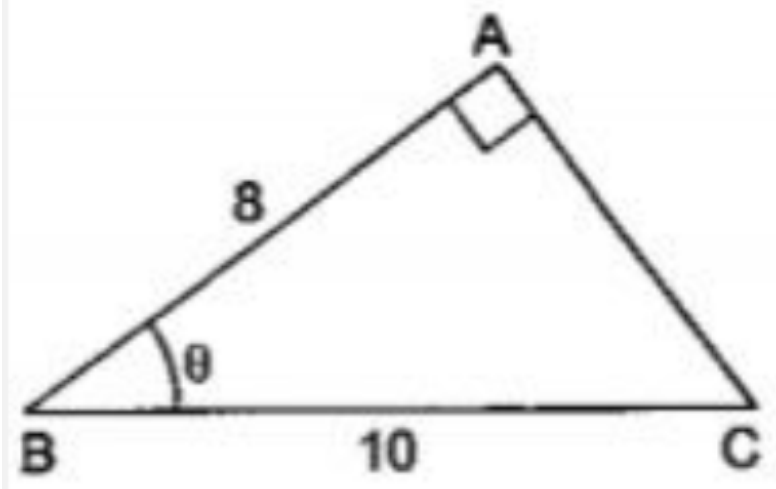
**11.** Find $\tan\theta$.

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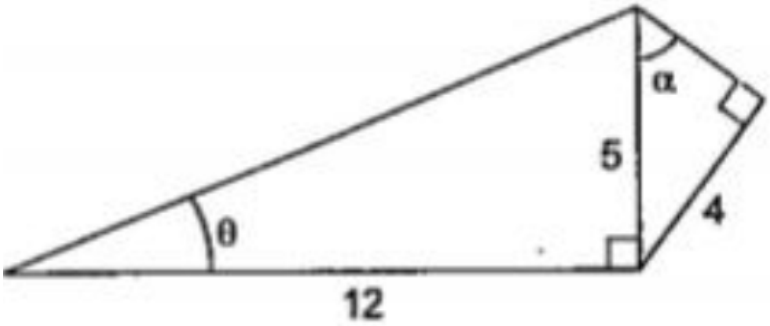
**12.** Find $\sec\theta$.

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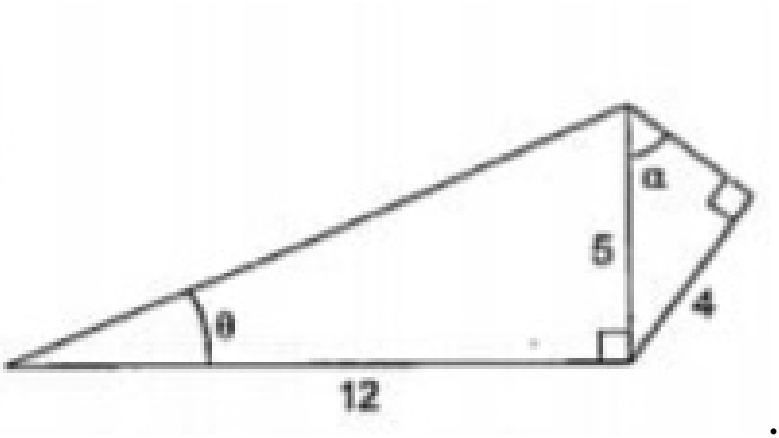
**13.** Find $\cos^2\theta - \sin^2\theta$.

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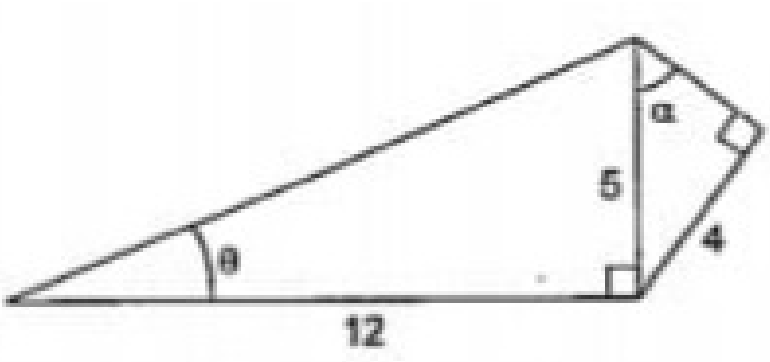
**14.** Find $\cot \alpha$.

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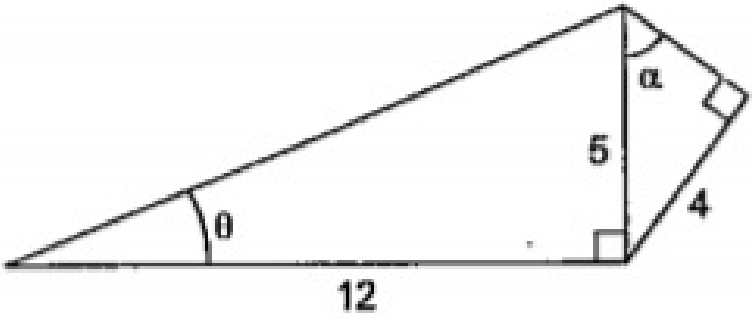
**15.** Find $\cot^2 \alpha - \cos^2 \alpha$.

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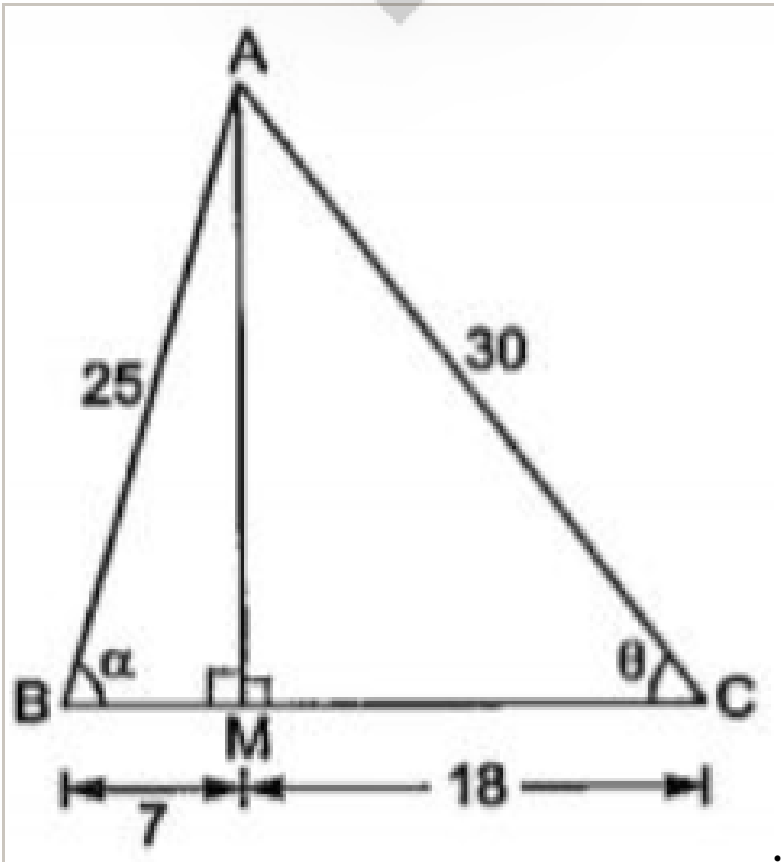
**16.** Find $\sec^2\theta - \dfrac{1}{\cot^2\theta}$.

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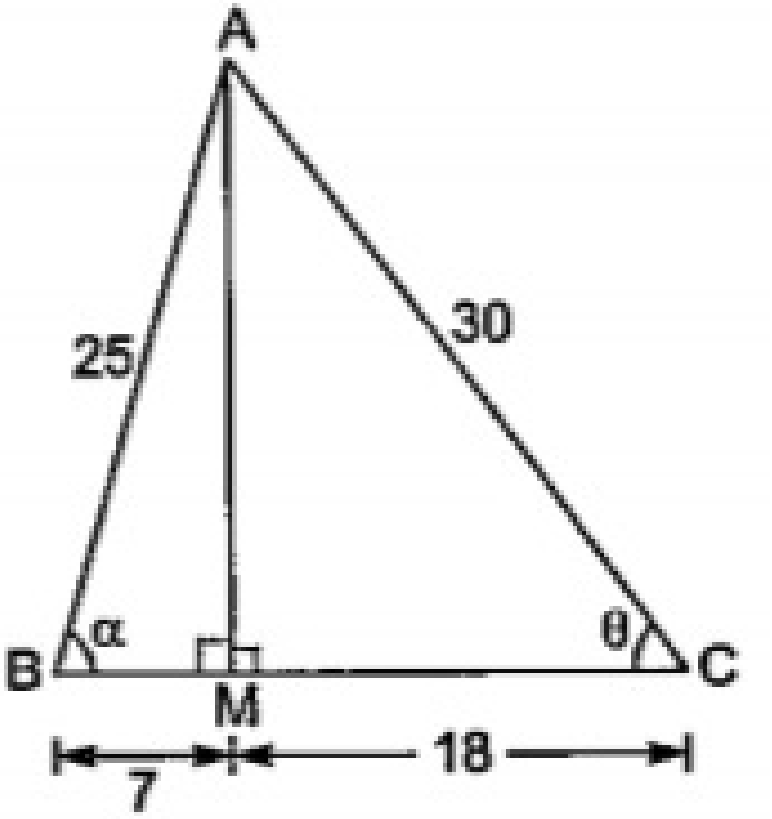
**17.** Find $\cot^2\theta - \cot^2\alpha$.

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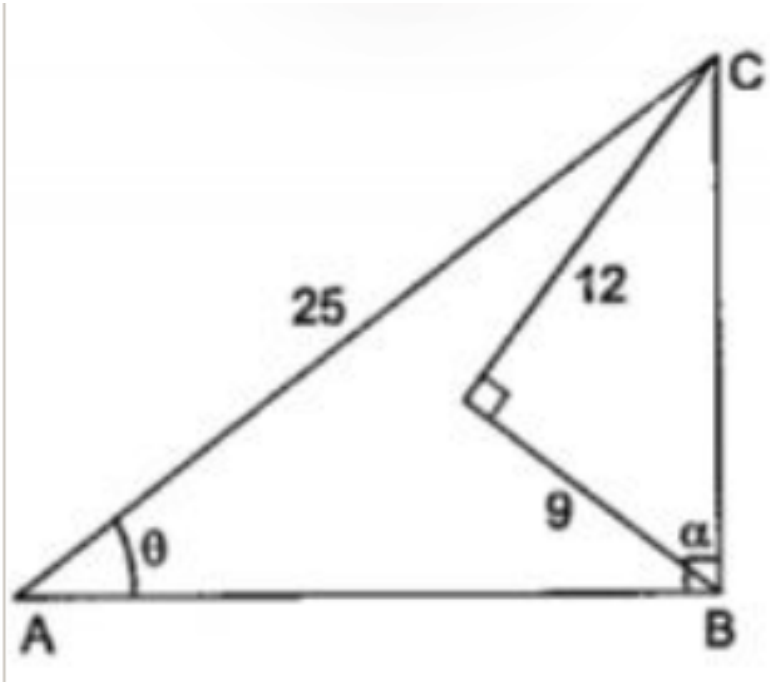
**18.** Find $1\left(\tan^2\theta\right) - \dfrac{1}{\sin^2\theta}$.

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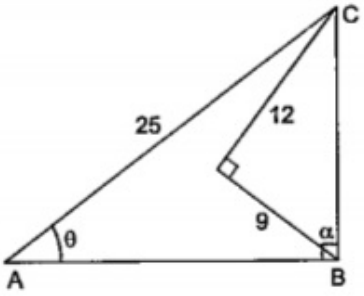
**19.** Find $\cot^2\theta - \sin^2\alpha$.

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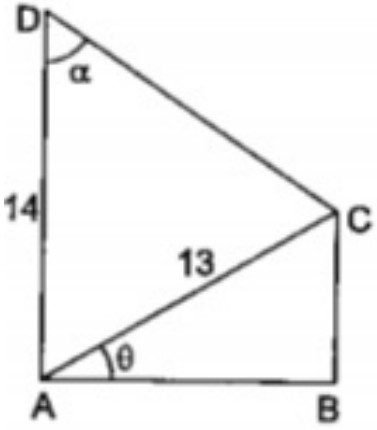
**20.** Find $\cot \alpha$.

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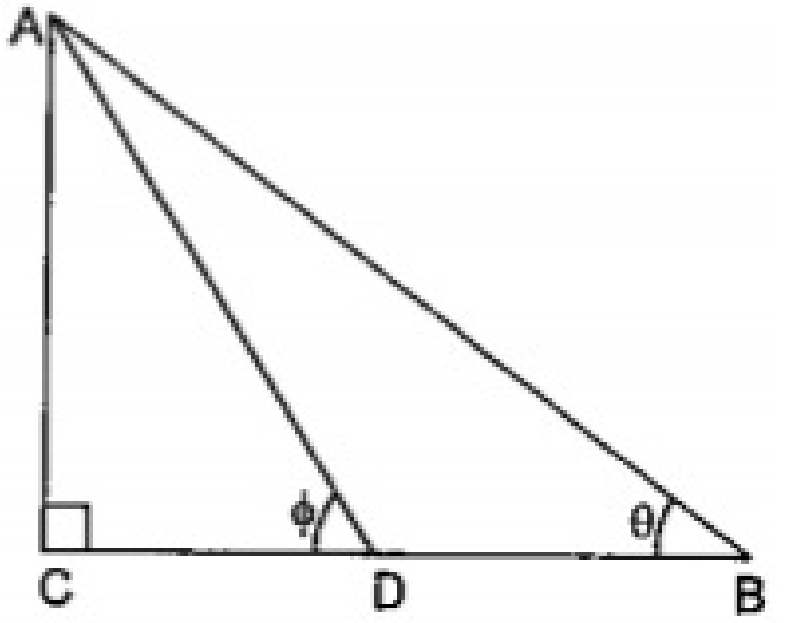
**21.** D is the mid point of BC show that $\frac{\tan\theta}{\tan\phi} = \frac{1}{2}$.

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**22.** If $\sin\theta = \frac{5}{13}$, find the value of $(\cot\theta + \operatorname{cosec}\theta)$.

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**23.** If $\cos\theta = \frac{4}{5}$, find the value of $(\sec\theta + \tan\theta)$.

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**24.** If $\tan\theta = \frac{3}{4}$, find the value of $\cos^2\theta - \sin^2\theta$.

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**25.** If $\sec\theta = 4$, find the value of $\dfrac{\cos\theta}{4\cos^2\theta + 3\sin^2\theta}$.

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**26.** If $4\tan\theta = 3$, find the value of $\dfrac{4\sin\theta - 3\cos\theta}{4\sin\theta + 3\cos\theta}$.

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**27.** If $5\cos\theta = 7\sin\theta$, find the value of $\dfrac{\sin\theta + \cos\theta}{2\sin\theta - 3\cos\theta}$.

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**28.** If $\tan\theta = \dfrac{a}{b}$ prove that $\dfrac{2\sec\theta + 1}{\cos\theta + 2}$ is $\dfrac{\sqrt{a^2 + b^2}}{b}$.

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**29.** If $\tan\theta = \frac{p}{q}$, proved that $\frac{p\sin\theta - q\cos\theta}{p\sin\theta + q\cos\theta}$ is $\frac{p^2 - q^2}{p^2 + q^2}$.

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**30.** If $\tan\theta = \frac{3}{4}$, proved that $\sin^2\theta + \cos^2\theta$ is

1.

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**31.** If $\tan\theta = \left(\sqrt{2}\right) - 1$,prove that $\sin\theta\cos\theta = \frac{1}{2}$..

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**32.** In a right angled triangle ABC, right angled at B find $\cos A - \sin A$ if BC= 80 cm, AC - AB =2 cm.

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**33.** In a right angled triangle ABC, right angled at B find $\cos A - \sin A$ if BC= 20 cm, AC - AB =10 cm.

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**34.** In a right angled triangle ABC, right angled at B find $\cos A - \sin A$ if BC= 9 cm, AC - AB =1 cm.

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**35.** In an isosceles triangle ABC if AB = AC= 10 cm and BC =12 cm, find the values of $\tan\angle ACB$ and $\cos ec\angle ACB$.

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**36.** In an isosceles triangle ABC if AB = AC= 15 cm and BC =18 cm, find the values of $\cos\angle ABC$ and $\sin\angle ABC$.

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**37.** In $\triangle ABC\ \angle B = 90^\circ$ if AB = 40 cm and AC + BC =50 cm, find $\sin A$.

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**38.** In $\triangle ABC\ \angle B = 90^\circ$ if AB = 40 cm and AC + BC =50 cm, find $\tan A$.

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**39.** In $\triangle ABC\ \angle A = 90^\circ$ if AB = 7 cm and BC - AC = 1 cm, find $\cos C$.

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**40.** In $\triangle ABC \angle A = 90^\circ$ if AB = 7 cm and BC - AC = 1 cm, find $\cot B$.

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**41.** The diagonals AC, BD of rhombus ABCD meet at O. If AC = 6 cm and BD =8 cm find $\sin\angle OCD, \cos\angle OCB$.

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**42.** E is the mid point of the side AB of the square ABCD, if $\angle AED = \theta$ then find the value of $\cos\theta$ and $\sin\theta$.

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**43.** AOB is diameter of a circle whose centre is O and C is any point on the circle. Join A and C , B and C and O and C. Show that $\left(\sin^2\angle BCO + \sin^2\angle ACO\right) = 1$.

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