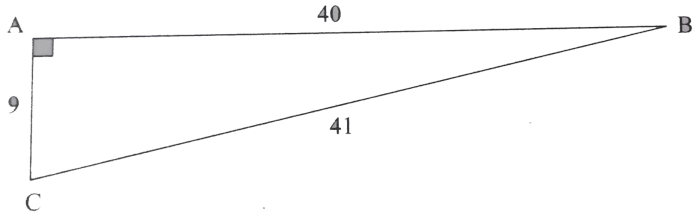
MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

TRIGONOMETRY

Exercise 6 1

1. From the given figure, find all the trigonometric ratios of angle B.



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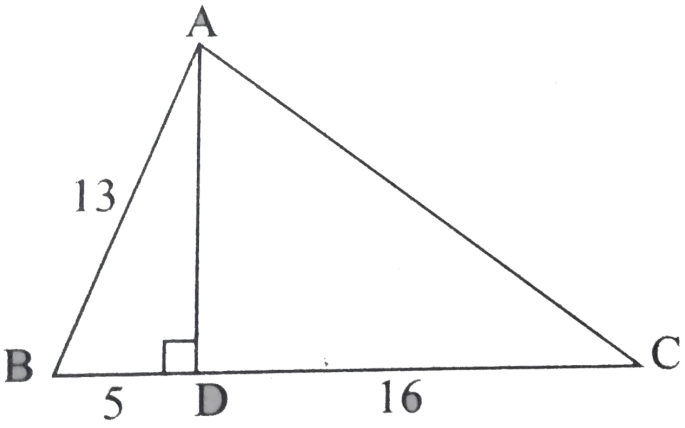
2. From the given figure, find the values of

(i) sin B (ii) sec B (iii) cot B (iv) cos C

(v) tan C (vi) cosec C



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3. If $2\cos\theta = \sqrt{3}$, then find all the trigonometric ratios of angle θ.

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4. If $\cos A = \frac{3}{5}$, then find the value of $\frac{\sin A - \cos A}{2\tan A}$

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5. If $\cos A = \frac{2x}{1+x^2}$, then find the values of sin A and tan A in terms of x.

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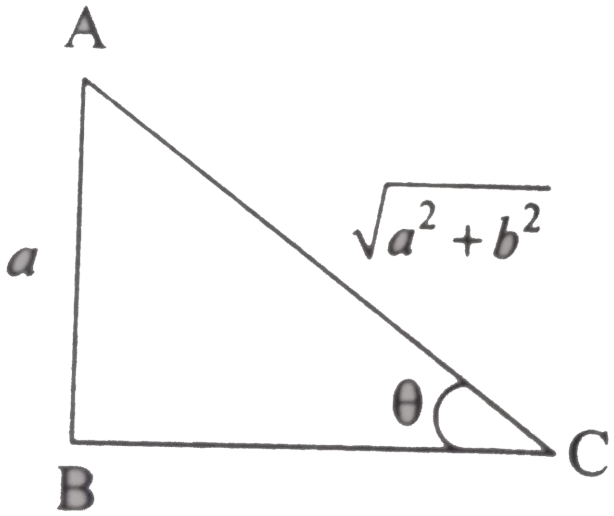
6. If $\sin\theta = \dfrac{a}{\sqrt{a^2+b^2}}$ then show that b sin θ = a cos θ.



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7. If 3 cot A = 2, then find the value of $\dfrac{4\sin A - 3\cos A}{2\sin A + 3\cos A}$

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8. If $\cos\theta : \sin\theta = 1:2$, then find the value of $\dfrac{8\cos\theta - 2\sin\theta}{4\cos\theta + 2\sin\theta}$

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9. A boy standing at point O finds his kite flying at a point P with distance OP = 25m. It is at a height of 5m from the ground . When the thread is extended by 10 m from P, it reaches a point Q. What will be the height QN of the kite from the ground? (use trigonometric ratios)

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Exercise 6 2

1. $1 - \tan^2 45^\circ =$ _ _ .

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2. Find the value of the following:

$$\frac{\tan 45^\circ}{\text{cosec}30^\circ} + \frac{\sec 60^\circ}{\cot 45^\circ} - \frac{5\sin 90^\circ}{2\cos 0^\circ}$$

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3. If $A = 30^\circ$ verify that $\cos 3A = 4\cos^3 A - 3\cos A$

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4. Find the valueof $8\sin 2x.\ \cos 4x.\ \sin 6x$, when $x = 15^\circ$.

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Exercise 6 3

1. Find the value of $\frac{\cot\theta}{\tan(90^\circ-\theta)}+\frac{\cos(90^\circ-\theta)\tan\theta\sec(90^\circ-\theta)}{\sin(90^\circ-\theta)\cot(90^\circ-\theta)\cos ec(90^\circ-\theta)}$

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Exercise 6 4

1. Find the value of the following :

$\sin 21^\circ 21'$

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2. Find the value of θ if

$\sin\theta = 0.9975$

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3. Find the value of the following :

$\sin 65^\circ 39$+cos24^(@)57'+tan10^(@)10'`

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4. Find the area of a right triangle whose hypotenuse is 10 cm and one of the acute angle is 24° 24'.

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5. Find the angle made by a ladder of length 5m with the ground, if one of its end is 4m away from the wall and the other end is on the wall.

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6. In the given figure, HT shows the height of a tree standing vertically. From a point P, the angle of elevation of the top of the tree (that is $\angle P$) measures 45° and the distance to the tree is 60 metres. Find the height of the tree.

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Exercise 6 5

1. If $\sin 30^\circ = x$ and $\cos 60^\circ = y$, then $x^2 + y^2$ is

A. $\frac{1}{2}$

B. 0

C. $\sin 90^\circ$

D. $\cos 90^\circ$

Answer: A

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2. If $\tan\theta = \cot 37^\circ$, then the value of θ is

A. 37°

B. 53°

C. 90°

D. 1°

Answer: B

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3. The value of $\tan 72^\circ . \tan 18^\circ$ is.....

A. 0

B. 1

C. 18°

D. 72°

Answer: B

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4. The value of $\frac{2\tan 30^\circ}{1-\tan^2 30^\circ}$ is equal to

A. $\cos 60^\circ$

B. $\sin 60^\circ$

C. $\tan 60^\circ$

D. $\sin 30^\circ$

Answer: C

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5. If $2\sin 2\theta = \sqrt{3}$,then the value of θ is :

A. 90°

B. 30°

C. 45°

D. 60°

Answer: B

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6. The value of $3\sin 70^\circ \sec 20^\circ + 2\sin 49^\circ \sec 51^\circ$ is.....

A. 2

B. 3

C. 5

D. 6

Answer: C

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7. The value of $\frac{1-\tan^2 45^\circ}{1+\tan^2 45^\circ}$ is

A. 2

B. 1

C. 0

D. $\frac{1}{2}$

Answer: C

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8. The value of $\cos ec(70^\circ + \theta) - \sec(20^\circ - \theta) + \tan(65^\circ + \theta) - \cot(25^\circ - \theta)$ is.....

A. 0

B. 1

C. 2

D. 3

Answer: A

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9. The value of $\tan 1^\circ \tan 2^\circ \tan 3^\circ \ldots \tan 89^\circ$ is

A. 0

B. 1

C. 2

D. $\frac{\sqrt{3}}{2}$

Answer: B

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10. If $\sin\alpha = \frac{1}{2}$ and $\cos\beta = \frac{1}{2}$, then the value of $(\alpha + \beta)$ is

A. 0°

B. 90°

C. 30°

D. 60°

Answer: B

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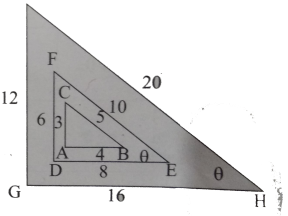
Thinking Corner

1. The given triangles ABC, DEF and GHI have measures 3-4-5, 6-8-10 and 12-16-20. Are they all right triangles? How do you know? The angles at the vertices B, E and H are of equal size (each angle is equal to θ). With these available details, fill up the following table and comment on the ratios that you get.

In ΔABC	In ΔDEF	In ΔGHI
$\sin\theta = \frac{3}{5}$	$\sin\theta = \frac{6}{10} = ?$	$\sin\theta = \frac{12}{20} = ?$
$\cos\theta = ?$	$\cos\theta = ?$	$\cos\theta = ?$
$\tan\theta = \frac{3}{4}$	$\tan\theta = ?$	$\tan\theta = ?$



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2. The sets of three numbers are called as Pythagorean triplets as they form the sides of a right angled triangle:

(a) 3,4,5 (b) 5,12,13 (c) 7,24,25

Multiply each number in any of the above pythagorean triplet by a non-zero constant. Verify whether each of the resultant set so obtained is also a pythagorean triplet or not.

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3. What are the minimum and maximum values of $\sin\theta$?

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4. What are the minimum and maximum values of $\cos\theta$?

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Additional Questions Solved

1. The value of $\cos ec^2 60 - 1$ is equal to.....

A. $\cos^2 60$

B. $\cot^2 60$

C. $\sec^2 60$

D. $\tan^2 60$

Answer: b

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2. The value of $\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ$ is equal is.....

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3. The value of $\frac{\sin 57^\circ}{\cos 33^\circ}$ is.....

A. $\cot 63^\circ$

B. $\tan 27^\circ$

C. 1

D. 0

Answer: c

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4. If $3x \cos ec36^\circ = \sec 54^\circ$ then the value of x is.....

A. 0

B. 1

C. $\frac{1}{3}$

D. $\frac{3}{4}$

Answer: c

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5. If $\cos A. \cos 30^\circ = \frac{\sqrt{3}}{4}$, then the measures of A is.....

A. 90°

B. 60°

C. 45°

D. 30°

Answer: b

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Additional Questions Solved Answer The Following Question

1. Given $\sec\theta = \frac{13}{12}$. Calculate all other trigonometric ratios.

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2. If $3\cot A = 4$, check whether $\frac{1-\tan^2 A}{1+\tan^2 A} = \cos^2 A - \sin^2 A$ or not.

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3. Evaluate $\frac{\sin 30^\circ + \tan 45^\circ - \cos ec60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$

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4. Find A if $\sin 20^\circ \tan A \sec 70^\circ = \sqrt{3}$

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5. Find the area of a right triangle whose hypotenuse is 10 cm and one of the acute angle is 24° 24'.

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Assignment I Choose The Best Answer

1. The value of $\sec^2 60^\circ - \tan^2 60^\circ$ is.....

A. $\sin^2 30^\circ - \cos^2 30^\circ$

B. $\sin^2 30^\circ + \cos^2 30^\circ$

C. $\tan^2 45^\circ + \cot^2 45^\circ$

D. $\sin^2 60^\circ + \cos^2 30^\circ$

Answer: B

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2. The value of $\frac{2\tan 30^\circ}{1 - \tan^2 30^\circ}$ is equal to

A. $\tan 45^\circ$

B. $\tan 30^\circ$

C. $\tan 60^\circ$

D. $\tan 90^\circ$

Answer: C

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3. Find the value of $2\sin 30^\circ \cos 30^\circ$.

A. $\tan 30^\circ$

B. $\cos 60^\circ$

C. $\sin 60^\circ$

D. $\cot 60^\circ$

Answer: C

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4. The value of $\frac{\sin 27^\circ}{\cos 63^\circ}$ is.....

A. 0

B. 1

C. $\tan 27^\circ$

D. $\cot 63^\circ$

Answer: B

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5. If $\cos x = \sin 43^\circ$, then the value of x is.....

A. 57°

B. 43°

C. 47°

D. 90°

Answer: C

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6. The value of $\sec 29^\circ - \cos ec61^\circ$ is.....

A. 1

B. $\sec 60^\circ$

C. $\cos ec29^\circ$

D. 0

Answer: D

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7. The value of $\tan 26^\circ . \tan 64^\circ$ is.....

A. $\frac{1}{2}$

B. $\frac{\sqrt{3}}{2}$

C. 1

D. 0

Answer: C

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8. If $\sin A = \frac{9}{15}$ then sec A is.....

A. $\frac{15}{9}$

B. $\frac{15}{12}$

C. $\frac{12}{15}$

D. $\frac{9}{12}$

Answer: B

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Assignment Ii Answer The Following Questions

1. Find the other trigonometric ratios of $\sec A = \frac{17}{8}$

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2. If $\sec\theta = \frac{13}{5}$, show that $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta} = 3$

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3. Evaluate $\frac{12\cos^2 30^\circ - 2\tan^2 60^\circ}{4\sec^2 45^\circ}$

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4. Find the value of $3\frac{\tan 67^\circ}{\cot 23^\circ} + \frac{\sin 42^\circ}{2\cos 48^\circ} + \frac{5\cos ec61^\circ}{2\sec 29^\circ}$

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5. Simplify $\frac{\sin 35^\circ}{\cos 55^\circ} + \frac{\cos 55^\circ}{\sin 35^\circ} - 2\cos^2 60^\circ$

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6. A ladder makes an angles 30° with the floor and its lower end is 12m away from the wall. Find the length of the ladder.

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7. In an isosceles triangle with base α, vertical angle 20° and lateral side each of length b, prove that $a^3 + b^3 = 3ab^2$.

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