



MATHS

NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

TRIGONOMETRY

Example

1. Evaluate :

$$\sin 30^\circ + \cos 30^\circ$$



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2. Evaluate :

$$\tan 60^\circ \cot 60^\circ$$



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3. Evaluate :

$$\frac{\tan 45^\circ}{\tan 30^\circ + \tan 60^\circ}$$



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4. Evaluate :

$$\sin^2 45^\circ + \cos^2 45^\circ$$



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5. Find the values of the following:

$$(\cos 0^\circ + \sin 45^\circ + \sin 30^\circ)(\sin 90^\circ - \cos 45^\circ + \cos 60^\circ)$$

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6. Find the values of the following:

$$\tan^2 60^\circ - 2 \tan^2 - \cot^2 30^\circ + 2 \sin^2 30^\circ + \frac{3}{4} \operatorname{cosec}^2 45^\circ$$

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7. Express

$\sin 74^\circ$ in terms of cosine

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8. Express

$\tan 12^\circ$ in terms of cotangent



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9. Express

$\operatorname{cosec} 39^\circ$ in terms of secant



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10. Find the values of

$\tan 7^\circ \tan 23^\circ \tan 60^\circ \tan 67^\circ \tan 83^\circ$



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11. Find the values of

$$\frac{\cos 35^\circ}{\sin 55^\circ} + \frac{\sin 12^\circ}{\cos 78^\circ} - \frac{\cos 18^\circ}{\sin 72^\circ}$$



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12. Find the value of

$$\sin 38^\circ 36' + \tan 12^\circ 12'$$



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13. Find the value of

$$\tan 60^\circ 25' - \cos 49^\circ 20'$$



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14. Find the value of θ if

$$\sin \theta = 0.9858$$



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15. Find the value of θ if

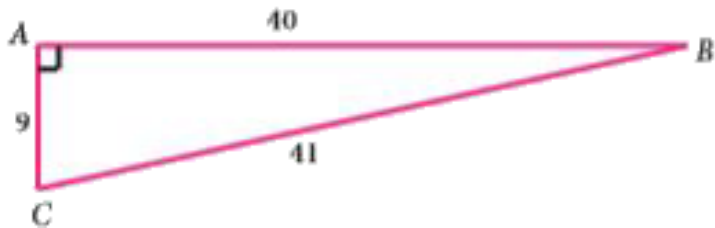
$$\cos \theta = 0.7656$$



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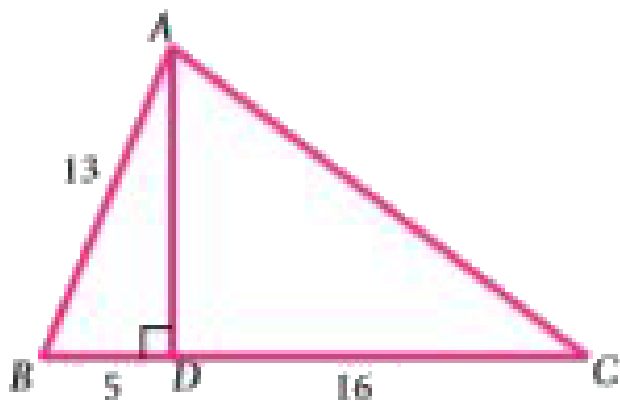
Exercise 6 1

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



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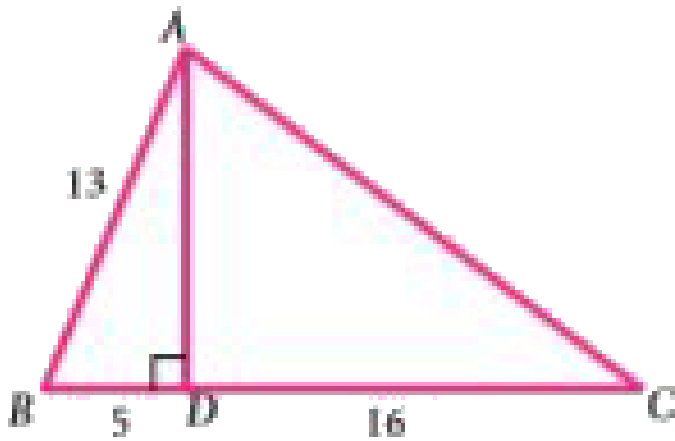
2. From the given figure, find the values of



$\sin B$

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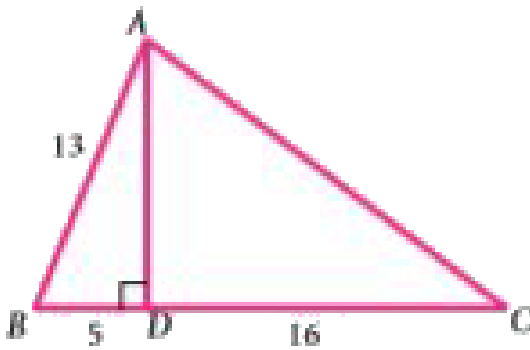
3. From the given figure, find the values of



$\sec B$

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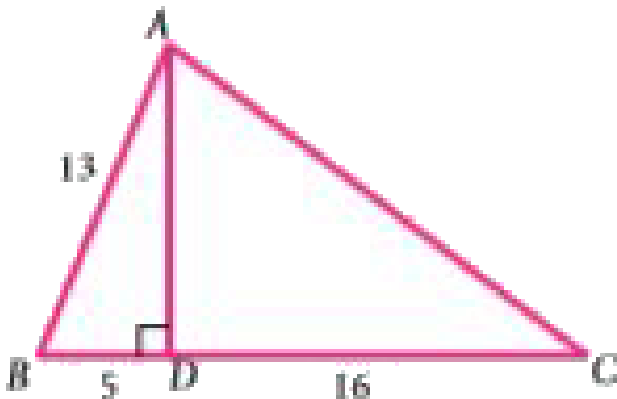
4. From the given figure, find the values of



$\cot B$

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5. From the given figure, find the values of

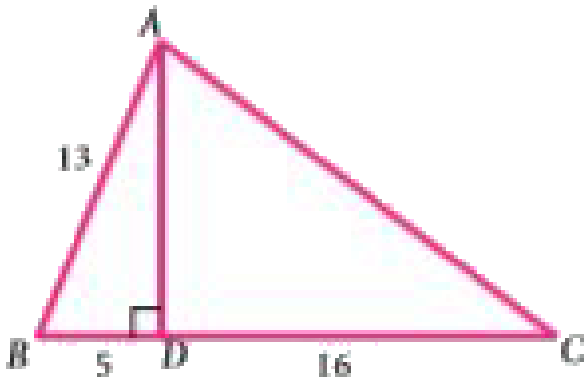


cos C



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6. From the given figure, find the values of

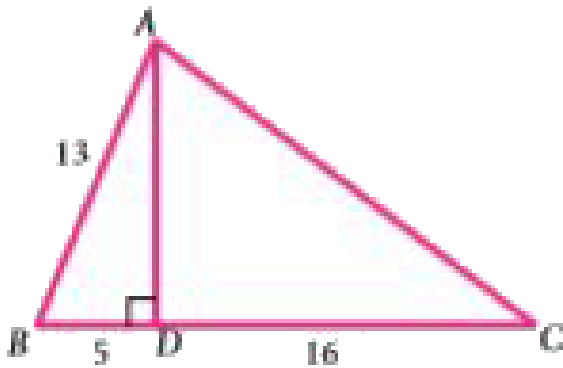


tan C



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7. From the given figure, find the values of



$\operatorname{cosec} C$

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

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



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



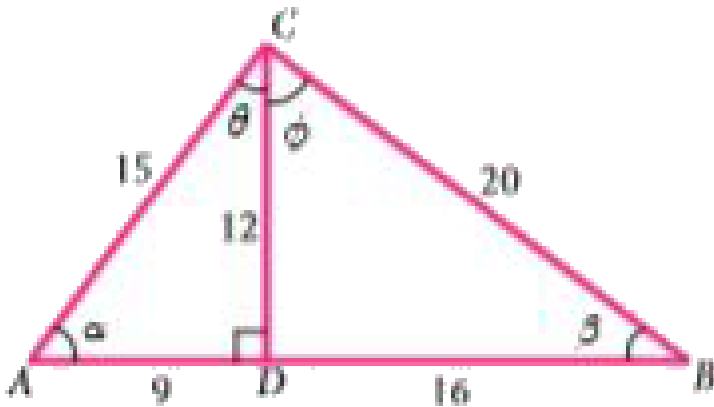
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12. If $\cos \theta : \sin \theta = 1 : 2$, then find the value of $\frac{8 \cos \theta - 2 \sin \theta}{4 \cos \theta + 2 \sin \theta}$.



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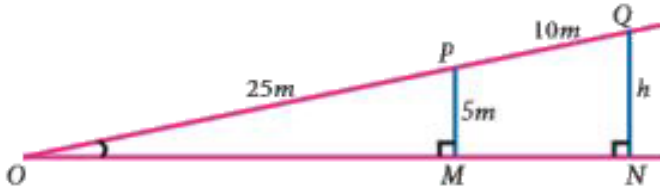
13. From the given figure, prove that $\theta + \phi = 90^\circ$. Also prove that there are two other right angled triangles. Find $\sin \alpha$, $\cos \beta$ and $\tan \phi$.



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14. A boy standing at a point O finds his kite flying at a point P with distance $OP=25\text{m}$. It is at a height of 5m from the

ground. When the thread is extended by 10m 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. Verify the following equalities:

$$\cos 90^\circ = 1 - \sin^2 45^\circ = 2 \cos^2 45^\circ - 1$$

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2. Verify the following equalities:

$$1 + \tan^2 30^\circ = \sec^2 30^\circ$$

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3. Verify the following equalities:

$$\sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ = \sin 90^\circ$$

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Exercise 6 3

1. Find the value of the following:

$$\left(\frac{\cos 47^\circ}{\sin 43^\circ} \right)^2 + \left(\frac{\sin 72^\circ}{\cos 18^\circ} \right) - 2 \cos^2 45^\circ$$

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2. Find the value of the following:

$$\frac{\cos 70^\circ}{\sin 20^\circ} + \frac{\cos 59^\circ}{\sin 31^\circ} + \frac{\cos \theta}{\sin(90^\circ - \theta)} - 8 \cos^2 60^\circ$$

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3. Find the value of the following:

$$\tan 15^\circ \tan 30^\circ \tan 45^\circ \tan 60^\circ \tan 75^\circ$$

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4. Find the value of the following:

$$\frac{\cot \theta}{\tan(90^\circ - \theta)} + \frac{\cos(90^\circ - \theta) \tan \theta \sec(90^\circ - \theta)}{\sin(90^\circ - \theta) \cot(90^\circ - \theta) \operatorname{cosec}(90^\circ - \theta)}$$

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Exercise 6 4

1. Find the value of the following:

$$\sin 49^\circ$$



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2. Find the value of the following:

$$\cos 74^\circ 39'$$



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3. Find the value of the following:

$$\tan 54^\circ 26'$$



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4. Find the value of the following:

$$\sin 21^\circ 21'$$



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5. Find the value of the following:

$$\cos 33^\circ 53'$$



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6. Find the value of the following:

$$\tan 70^\circ 17'$$



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7. Find the value of θ if

$$\sin \theta = 0.9975$$



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8. Find the value of θ if

$$\cos \theta = 0.6763$$



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9. Find the value of θ if

$$\tan \theta = 0.0720$$



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10. Find the value of θ if

$$\cos \theta = 0.0410$$



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11. Find the value of θ if

$$\tan \theta = 7.5958$$



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12. Find the value of the following:

$$\sin 65^{\circ} 39' + \cos 24^{\circ} 57' + \tan 10^{\circ} 10'$$

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13. Find the value of the following:

$$\tan 70^{\circ} 58' + \cos 15^{\circ} 26' - \sin 84^{\circ} 59'$$

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14. Find the area of a right triangle whose hypotenuse is 10cm and one of the acute angle is $24^{\circ} 24'$

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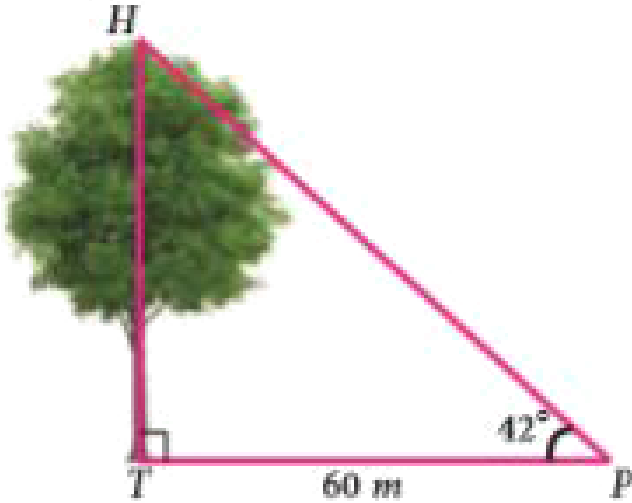
15. Find the angle made by a ladder of length 5m with the ground, if one of its end is 4m away from the wall and the other end is on the wall.



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16. 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 42° and the distance to the

tree is 60 metres. Find the height of the tree.



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Exercise 6 5 Multiple Choice Questions

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. $\cos 90^\circ$

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

A. 90°

B. 30°

C. 45°

D. 60°

Answer: B



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

C. 0

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

Answer: C

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8. The value of $\operatorname{cosec}(70^\circ + \theta) - \sec(20^\circ - \theta) + \tan(65^\circ + \theta) - \cot(25^\circ - \theta)$

is

A. 0

B. 1

C. 2

D. 3

Answer: A



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

A. 0

B. 1

C. 2

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

Answer: B



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10. Given that $\sin \alpha = \frac{1}{2}$ 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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