



MATHS

BOOKS - ICSE

TRIGONOMETRICAL RATIOS OF STANDARD ANGLES

Example

1. Evaluate :

(i) $\sin^2 30^\circ - 2 \cos^3 60^\circ + 3 \tan^4 45^\circ$

(ii)

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



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2. Find the value of :

$$\frac{\sin 30^\circ - \sin 90^\circ + 2\cos 0^\circ}{\tan 30^\circ \times \tan 60^\circ}$$

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3. If $A = 60^\circ$, verify that :

(i) $\sin^2 A + \cos^2 A = 1$ (ii) $\sec^2 A - \tan^2 A = 1$

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4. If $x = 15^\circ$, evaluate : $8 \sin 2x \cos 4x \sin 6x$

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5. If $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

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6. If $A = 30^\circ$, then prove that :

$$\cos 3A = 4 \cos^3 A - 3 \cos A$$

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7. Find A , if :

$$\sin 2A = 1$$

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8. Find A, if :

$$2 \cos 3A = 1$$



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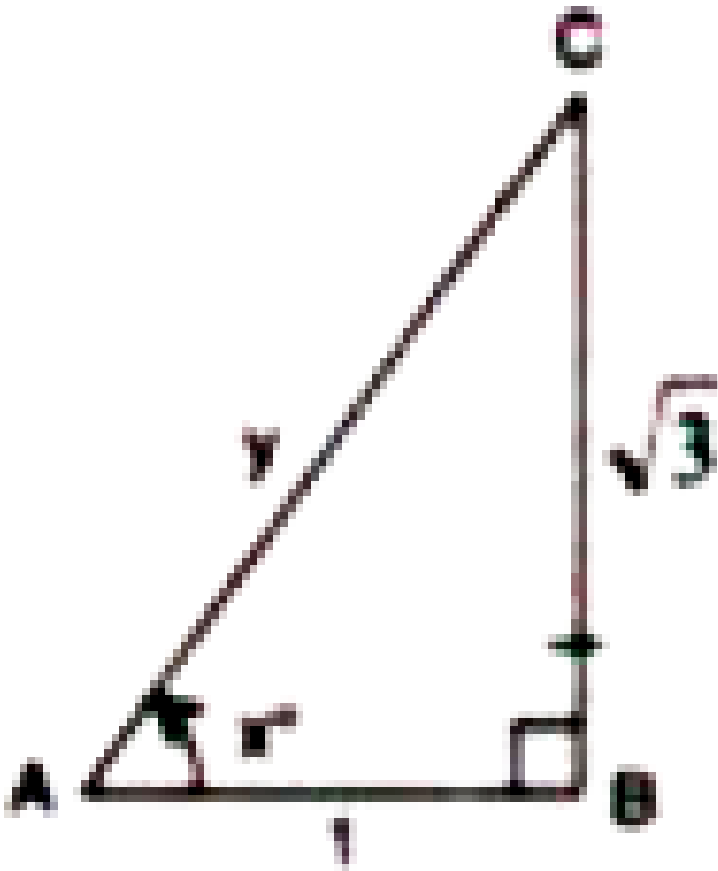
9. Find A, if :

$$(\sec A - 2)(\tan 3A - 1) = 0$$



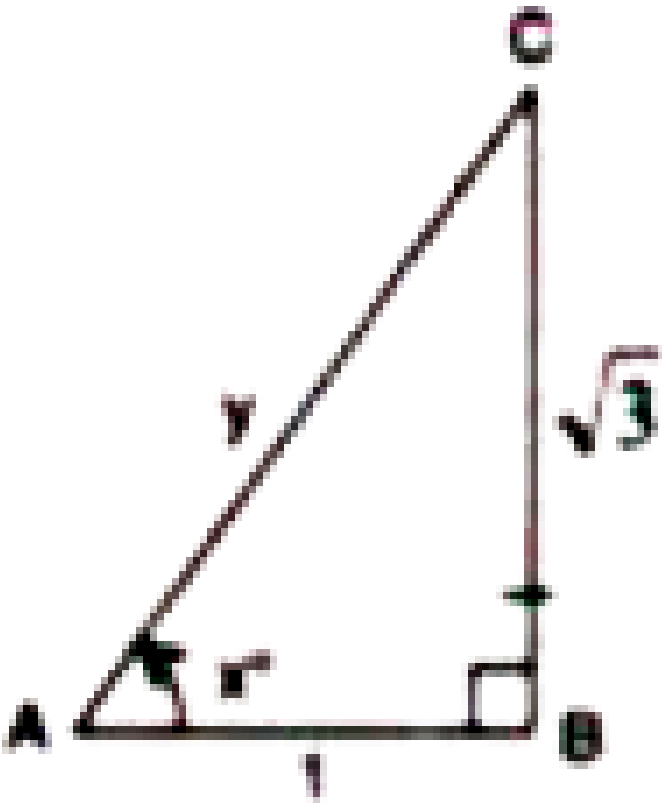
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10. From the adjoining figure, find : $\tan x^\circ$



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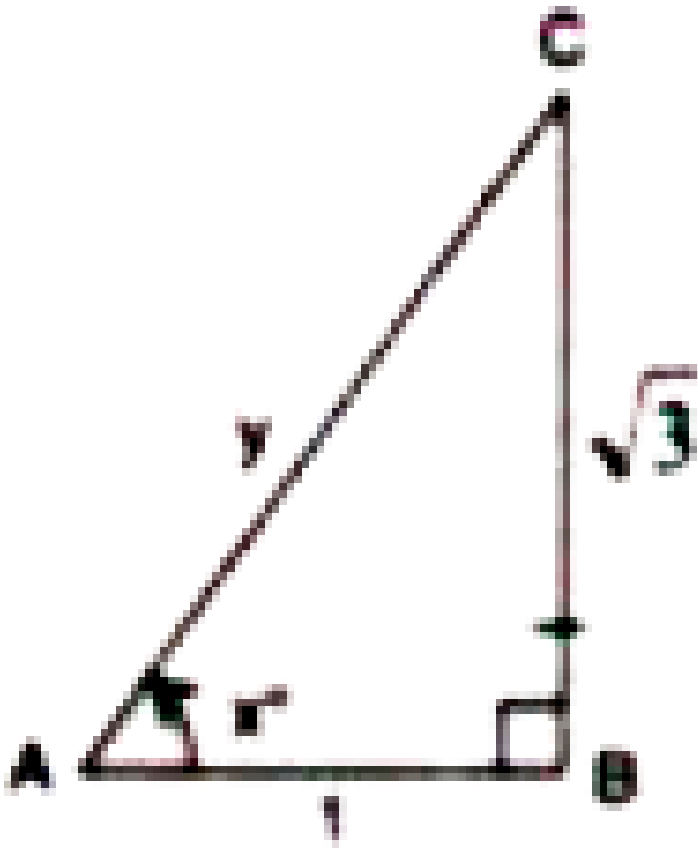
11. From the adjoining figure, find :



x°

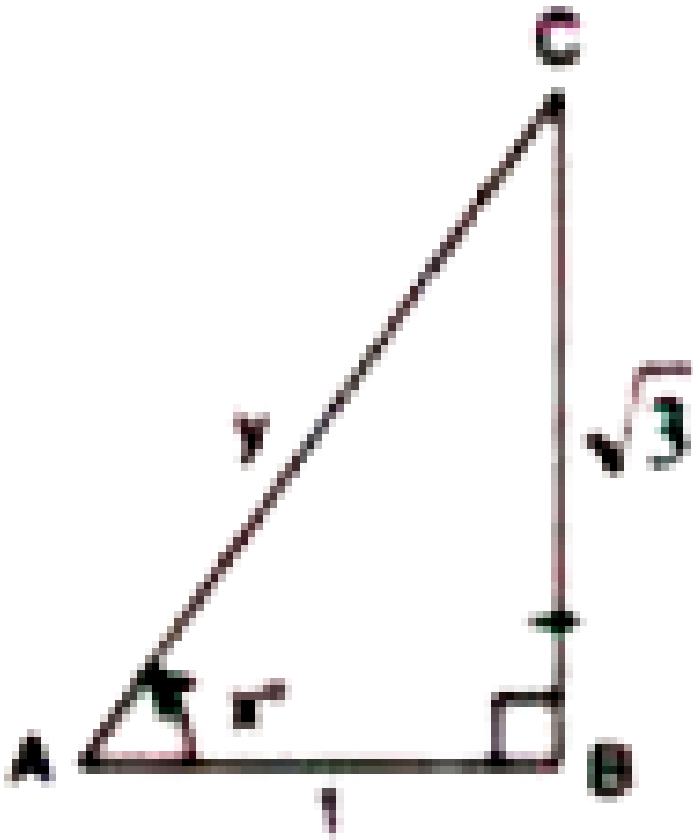
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12. From the adjoining figure, find : $\cos x^\circ$



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13. From the adjoining figure, find :



use $\tan x^\circ$ to find y .

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14. If $4 \sin^2 x^\circ - 3 = 0$ and x° is an acute angle, find :

(i) $\sin x^\circ$ (ii) x°

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15. Find the magnitude of angle A, if :

$$4 \sin A \sin 2A + 1 - 2 \sin 2A = 2 \sin A$$

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16. Find the magnitude of angle A, if :

$$2 \sin^2 A - 3 \sin A + 1 = 0$$

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17. Find the magnitude of angle A, if :

$$3 \cot^2(A - 5^\circ) = 1$$

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18. Find the magnitude of angle A, if :

$$\sin^2 2A + \sin^2 60^\circ = 1$$

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19. Find acute angles A and B, if

$$\sin(A + B) = \cos(A - B) = \frac{\sqrt{3}}{2}.$$

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20. If $\tan(A + B) = \sqrt{3}$ and $\sqrt{3}\tan(A - B) = 1$, find the angles A and B, where A and B are Acute Angles.

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21. If $\sqrt{3}\tan 2\theta = 3$ and $0^\circ < \theta \leq 90^\circ$, find the value of $3\sqrt{3}\cos \theta + 2\sin \theta - 6\tan^2 \theta$.

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22. Solve for θ ($0^\circ < \theta < 90^\circ$):

$$\sin^2 \theta - \frac{1}{2}\sin \theta = 0$$

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23. Solve for θ ($0^\circ < \theta < 90^\circ$):

$$2 \sin^2 \theta - 2 \cos \theta = \frac{1}{2}$$

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24. Solve for θ ($0^\circ < \theta < 90^\circ$):

$$\tan^2 \theta + 3 = 3 \sec \theta.$$

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25. Evaluate :

(i) $\sin^2 30^\circ - 2 \cos^3 60^\circ + 3 \tan^4 45^\circ$

(ii)

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



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26. Find the value of :

$$\frac{\sin 30^\circ - \sin 90^\circ + 2\cos 0^\circ}{\tan 30^\circ \times \tan 60^\circ}$$

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27. If $A = 60^\circ$, verify that :

(i) $\sin^2 A + \cos^2 A = 1$ (ii) $\sec^2 A - \tan^2 A = 1$

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$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

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30. If $A = 30^\circ$, then prove that :

$$\cos 3A = 4 \cos^3 A - 3 \cos A$$

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31. Find A , if :

$$\sin 2A = 1$$

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32. Find A, if :

$$2 \cos 3A = 1$$

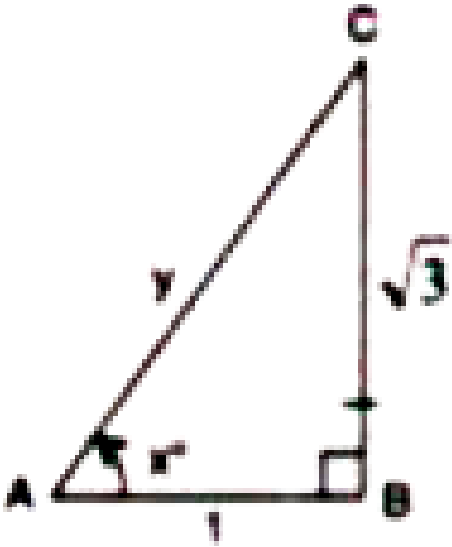
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33. Find A, if :

$$(\sec A - 2)(\tan 3A - 1) = 0$$

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34. From the adjoining figure, find :

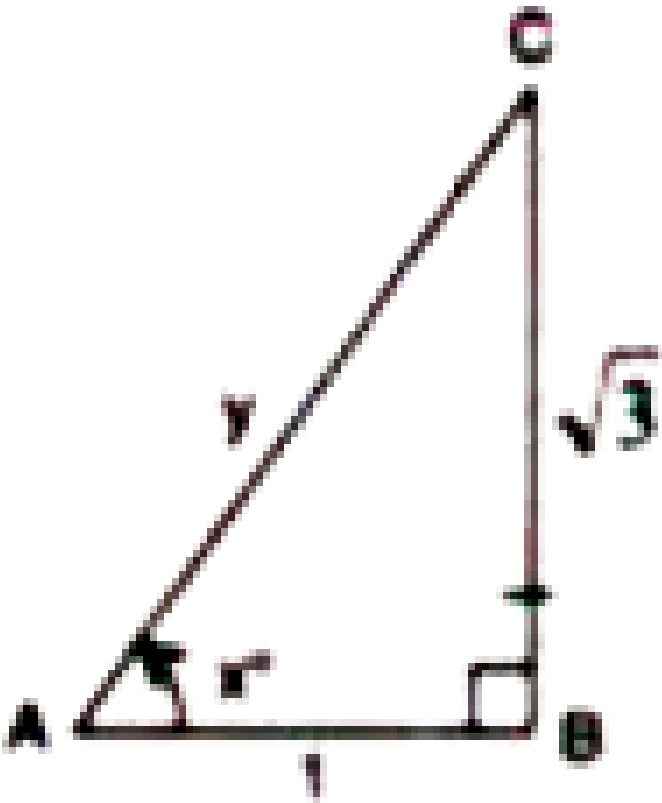


$\tan x^\circ$



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35. From the adjoining figure, find :

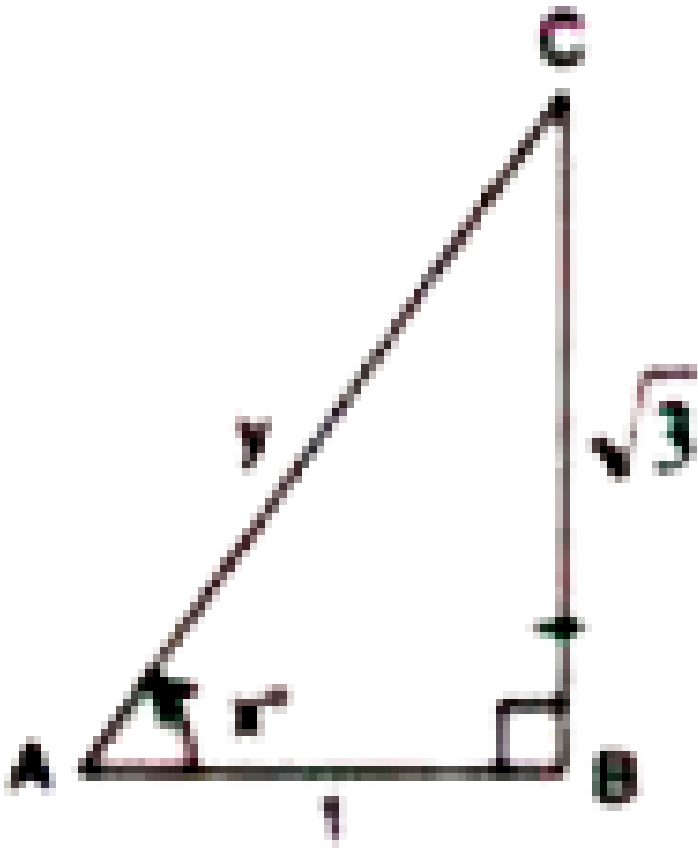


x°



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36. From the adjoining figure, find :

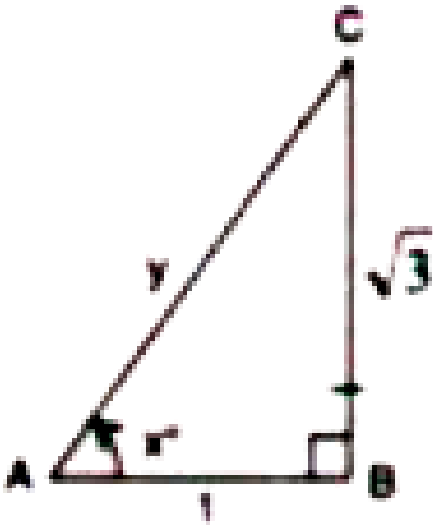


$\cos x^\circ$



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37. From the adjoining figure, find :



use $\sin x^\circ$ to find y .

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38. If $4 \sin^2 x^\circ - 3 = 0$ and x° is an acute angle, find :

- (i) $\sin x^\circ$ (ii) x°

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39. Find the magnitude of angle A, if :

$$4 \sin A \sin 2A + 1 - 2 \sin 2A = 2 \sin A$$



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40. Find the magnitude of angle A, if :

$$2 \sin^2 A - 3 \sin A + 1 = 0$$



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41. Find the magnitude of angle A, if :

$$3 \cot^2(A - 5^\circ) = 1$$



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42. Find the magnitude of angle A, if :

$$\sin^2 2x + \sin^2 60^\circ = 1$$

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43. Find acute angles A and B, if

$$\sin(A + B) = \cos(A - B) = \frac{\sqrt{3}}{2}.$$

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44. If $\tan(A + B) = \sqrt{3}$ and $\sqrt{3}\tan(A - B) = 1$, find the angles A and B.

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45. If $\sqrt{3} \tan 2\theta = 3$ and $0^\circ < \theta \leq 90^\circ$, find the value of $3\sqrt{3} \cos \theta + 2 \sin \theta - 6 \tan^2 \theta$.

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46. Solve for $\theta(0^\circ < \theta < 90^\circ)$:

$$\sin^2 \theta - \frac{1}{2} \sin \theta = 0$$

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47. Solve for $\theta(0^\circ < \theta < 90^\circ)$:

$$2 \sin^2 \theta - 2 \cos \theta = \frac{1}{2}$$

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48. Solve for θ ($0^\circ < \theta < 90^\circ$):

$$\tan^2 \theta + 3 = 3 \sec \theta.$$

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Exercise 23 A

1. Find the value of:

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

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2. Find the value of :

$$\tan 30^\circ \tan 60^\circ$$



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3. Find the value of :

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



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4. Find the value of :

$$\operatorname{cosec}^2 60^\circ - \tan^2 30^\circ$$



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5. Find the value of :

$$\sin^2 30^\circ + \cos^2 30^\circ + \cot^2 45^\circ$$

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6. Find the value of :

$$\cos^2 60^\circ + \sec^2 30^\circ + \tan^2 45^\circ$$

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7. Find the value of :

$$\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ$$

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8. Find the value of :

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

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9. Find the value of :

$$3\sin^2 30^\circ + 2\tan^2 60^\circ - 5\cos^2 45^\circ$$

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10. Prove that :

$$\sin 60^\circ \cos 30^\circ + \cos 60^\circ \cdot \sin 30^\circ = 1$$

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11. Prove that :

$$\cos 30^\circ \cdot \cos 60^\circ - \sin 30^\circ \cdot \sin 60^\circ = 0$$



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12. Prove that :

$$\cos^2 45^\circ - \cot^2 45^\circ = 1$$



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13. Prove that :

$$\cos^2 30^\circ - \sin^2 30^\circ = \cos 60^\circ$$



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14. Prove that :

$$\left(\frac{\tan 60^\circ + 1}{\tan 60^\circ - 1} \right)^2 = \frac{1 + \cos 30^\circ}{1 - \cos 30^\circ}$$

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15. Prove that :

$$3 \cos ec^2 60^\circ - 2 \cot^2 30^\circ + \sec^2 45^\circ = 0.$$

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16. Prove that :

$$\sin(2 \times 30^\circ) = \frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$$

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17. Prove that :

$$\cos(2 \times 30^\circ) = \frac{1 - \tan^2 30^\circ}{1 + \tan^2 30^\circ}$$

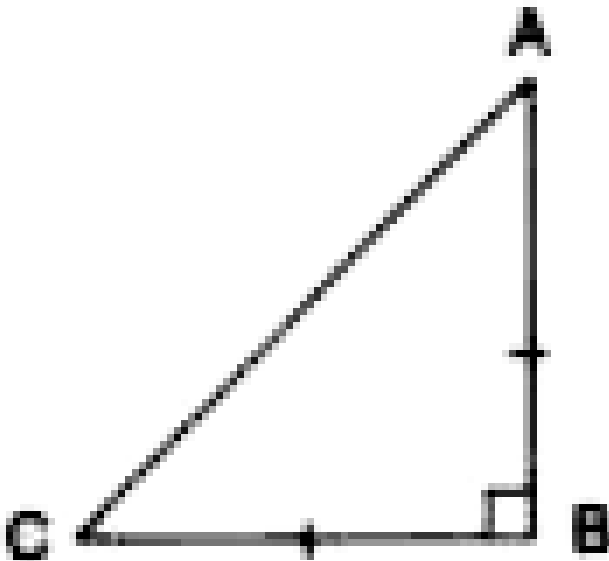
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18. Prove that :

$$\tan(2 \times 30^\circ) = \frac{2 \tan 30^\circ}{1 - \tan^2 30^\circ}$$

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19. ABC is an isosceles right-angled triangle. Assuming $AB = BC = x$, find the value of each of the following trigonometric ratios :



(i) $\sin 45^\circ$

(ii) $\cos 45^\circ$

(iii) $\tan 45^\circ$

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20. Prove that :

$$\sin 60^\circ = 2\sin 30^\circ \cos 30^\circ .$$

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21. Prove that :

$$4(\sin^4 30^\circ + \cos^4 60^\circ) - 3(\cos^2 45^\circ - \sin^2 90^\circ) = 2$$

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22. If $\sin x = \cos x$ and x is acute, state the value of x .

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23. If $\sec A = \operatorname{cosec} A$ and $0^\circ \leq A \leq 90^\circ$, state the value of A .

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24. If $\tan \theta = \cot \theta$ and $0^\circ \leq \theta \leq 90^\circ$, state the value of θ .

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25. If $\sin x = \cos y$, write the relation between x and y , if both the angles x and y are acute.

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26. If $\sin x = \cos y$, then $x + y = 45^\circ$, write true or false.

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27. $\sec \theta \cdot \cot \theta = \cos \theta$, write true or false.

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28. For any angle θ , state the value of :

$$\sin^2 \theta + \cos^2 \theta.$$

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29. State for any acute angle θ whether :

$\sin \theta$ increases or decreases as θ increases.

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30. State for any acute angle θ whether :

$\cos \theta$ increases or decreases as θ increases.

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31. State for any acute angle θ whether :

$\tan \theta$ increases or decreases as θ decreases.

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32. If $\sqrt{3} = 1.732$, find (correct to two decimal places) the value of the following $\sin 60^\circ$

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33. Evaluate :

$$\frac{\cos 3A - 3 \cos 4A}{\sin 3A + 2 \sin 4A}, \quad \text{when } A = 15^\circ.$$

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34. Evaluate :

$$\frac{3 \sin 3B + 2 \cos(2B + 5^\circ)}{2 \cos 3B - \sin(2B - 10^\circ)},$$

when $B = 20^\circ$.

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35. Find the value of :

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

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36. Find the value of :

$$\tan 30^\circ \tan 60^\circ$$

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37. Find the value of :

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

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38. Find the value of :

$$\operatorname{cosec}^2 60^\circ - \tan^2 30^\circ$$

 [Watch Video Solution](#)

39. Find the value of :

$$\sin^2 30^\circ + \cos^2 30^\circ + \cot^2 45^\circ$$



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40. Find the value of :

$$\cos^2 60^\circ + \sec^2 30^\circ + \tan^2 45^\circ$$



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41. Find the value of :

$$\tan^2 30^\circ + \tan^2 45^\circ + \tan^2 60^\circ$$



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42. Find the value of :

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

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43. Find the value of :

$$3\sin^2 30^\circ + 2\tan^2 60^\circ - 5\cos^2 45^\circ$$

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44. Prove that :

$$\sin 60^\circ \cos 30^\circ + \cos 60^\circ \cdot \sin 30^\circ = 1$$

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45. Prove that :

$$\cos 30^\circ \cdot \cos 60^\circ - \sin 30^\circ \cdot \sin 60^\circ = 0$$

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46. Prove that :

$$\cos^2 45^\circ - \cot^2 45^\circ = 1$$

 [Watch Video Solution](#)

47. Prove that :

$$\cos^2 30^\circ - \sin^2 30^\circ = \cos 60^\circ$$

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48. Prove that :

$$\left(\frac{\tan 60^\circ + 1}{\tan 60^\circ - 1} \right)^2 = \frac{1 + \cos 30^\circ}{1 - \cos 30^\circ}$$



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49. Prove that :

$$3 \cos ec^2 60^\circ - 2 \cot^2 30^\circ + \sec^2 45^\circ = 0.$$



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50. Prove that :

$$\sin(2 \times 30^\circ) = \frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$$



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51. Prove that :

$$\cos(2 \times 30^\circ) = \frac{1 - \tan^2 30^\circ}{1 + \tan^2 30^\circ}$$

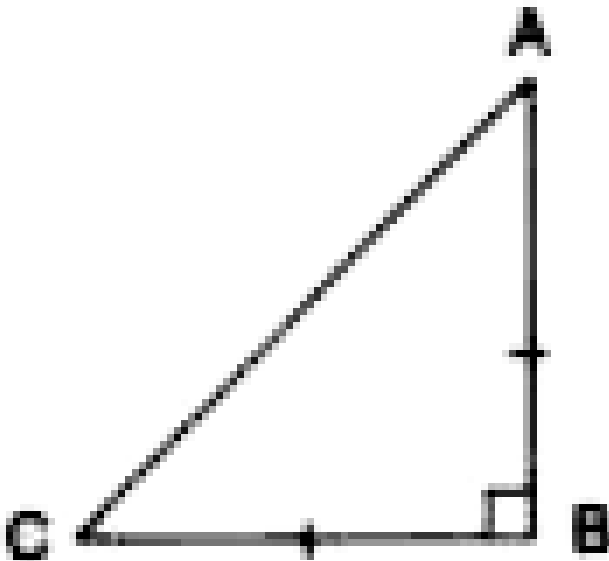
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52. Prove that :

$$\tan(2 \times 30^\circ) = \frac{2 \tan 30^\circ}{1 - \tan^2 30^\circ}$$

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53. ABC is an isosceles right-angled triangle. Assuming $AB = BC = x$, find the value of each of the following trigonometric ratios :



(i) $\sin 45^\circ$

(ii) $\cos 45^\circ$

(iii) $\tan 45^\circ$

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54. Prove that :

$$\sin 60^\circ = 2\sin 30^\circ \cos 30^\circ .$$

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55. Prove that :

$$4(\sin^4 30^\circ + \cos^4 60^\circ) - 3(\cos^2 45^\circ - \sin^2 90^\circ) = 2$$

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56. If $\sin x = \cos x$ and x is acute, state the value of x .

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57. If $\sec A = \operatorname{cosec} A$ and $0^\circ \leq A \leq 90^\circ$, state the value of A .

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58. If $\tan \theta = \cot \theta$ and $0^\circ \leq \theta \leq 90^\circ$, state the value of θ .

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59. If $\sin x = \cos y$, write the relation between x and y , if both the angles x and y are acute.

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60. If $\sin x = \cos y$, then $x + y = 45^\circ$, write true or false.

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61. $\sec \theta \cdot \cot \theta = \cos e c \theta$, write true or false.

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62. For any angle θ , state the value of :

$$\sin^2 \theta + \cos^2 \theta.$$

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63. State for any acute angle θ whether :

$\sin \theta$ increases or decreases as θ increases.

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64. State for any acute angle θ whether :

$\cos \theta$ increases or decreases as θ increases.

 [Watch Video Solution](#)

65. State for any acute angle θ whether :

$\tan \theta$ increases or decreases as θ decreases.

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66. If $\sqrt{3} = 1.732$, find (correct to two decimal places) the value of each of the following :

(i) $\sin 60^\circ$ (ii) $\frac{2}{\tan 30^\circ}$

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67. Evaluate :

$$\frac{\cos 3A - 3 \cos 4A}{\sin 3A + 2 \sin 4A}, \quad \text{when } A = 15^\circ.$$

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68. Evaluate :

$$\frac{3 \sin 3B + 2 \cos(2B + 5^\circ)}{2 \cos 3B - \sin(2B - 10^\circ)},$$

when $B = 20^\circ$.

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Exercise 23 B

1. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

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2. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

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3. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

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4. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \cdot \tan B}$$

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5. If $A = 30^\circ$, then prove that :

$$\sin 2A = 2 \sin A \cos A = \frac{2 \tan A}{1 + \tan^2 A}$$

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6. If $A = 30^\circ$, then prove that :

$$\begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= \frac{1 - \tan^2 A}{1 + \tan^2 A} \end{aligned}$$

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7. If $A = 30^\circ$, then prove that :

$$2 \cos^2 A - 1 = 1 - 2 \sin^2 A$$

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8. If $A = 30^\circ$, then prove that :

$$\sin 3A = 3 \sin A - 4 \sin^3 A$$

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9. If $A = B = 45^\circ$, show that :

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

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10. If $A = B = 45^\circ$, show that :

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

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11. If $A = 30^\circ$, show that :

$$\sin 3A = 4 \sin A \sin(60^\circ - A) \sin(60^\circ + A)$$

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12. If $A = 30^\circ$, show that :

$$(\sin A - \cos A)^2 = 1 - \sin 2A$$

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13. If $A = 30^\circ$, show that :

$$\cos 2A = \cos^4 A - \sin^4 A$$

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14. If $A = 30^\circ$, show that :

$$\frac{1 - \cos 2A}{\sin 2A} = \tan A$$

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15. If $A = 30^\circ$, show that :

$$\frac{1 + \sin 2A + \cos 2A}{\sin A + \cos A} = 2 \cos A.$$

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16. If $A = 30^\circ$, show that :

$$4 \cos A \cos(60^\circ - A) \cdot \cos(60^\circ + A) = \cos 3A$$

 [Watch Video Solution](#)

17. If $A = 30^\circ$, show that :

$$\frac{\cos^3 A - \cos 3A}{\cos A} + \frac{\sin^3 A + \sin 3A}{\sin A} = 3$$

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18. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

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19. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

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20. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

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21. Given $A = 60^\circ$ and $B = 30^\circ$, prove that :

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \cdot \tan B}$$

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22. If $A = 30^\circ$, then prove that :

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23. If $A = 30^\circ$, then prove that :

$$\begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= \frac{1 - \tan^2 A}{1 + \tan^2 A} \end{aligned}$$



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$$2 \cos^2 A - 1 = 1 - 2 \sin^2 A$$



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25. If $A = 30^\circ$, then prove that :

$$\sin 3A = 3 \sin A - 4 \sin^3 A$$

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26. If $A = B = 45^\circ$, show that :

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

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27. If $A = B = 45^\circ$, show that :

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

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28. If $A = 30^\circ$, show that :

$$\sin 3A = 4 \sin A \sin(60^\circ - A) \sin(60^\circ + A)$$

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29. If $A = 30^\circ$, show that :

$$(\sin A - \cos A)^2 = 1 - \sin 2A$$

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30. If $A = 30^\circ$, show that :

$$\cos 2A = \cos^4 A - \sin^4 A$$

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$$\frac{1 + \sin 2A + \cos 2A}{\sin A + \cos A} = 2 \cos A.$$

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33. If $A = 30^\circ$, show that :

$$4 \cos A \cos(60^\circ - A) \cdot \cos(60^\circ + A) = \cos 3A$$

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34. If $A = 30^\circ$, show that :

$$\frac{\cos^3 A - \cos 3A}{\cos A} + \frac{\sin^3 A + \sin 3A}{\sin A} = 3$$

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Exercise 23 C

1. Solve the following equations for A , if :

$$2 \sin A = 1$$

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2. Solve the following equations for A, if :

$$2 \cos 2A = 1$$

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3. Solve the following equations for A, if :

$$\sin 3A = \frac{\sqrt{3}}{2}$$

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4. Solve the following equations for A, if :

$$\sec 2A = 2$$

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5. Solve the following equations for A, if :

$$\sqrt{3} \tan A = 1$$

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6. Solve the following equations for A, if :

$$\tan 3A = 1$$

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7. Solve the following equations for A, if :

$$2 \sin 3A = 1$$

 [Watch Video Solution](#)

8. Solve the following equations for A, if :

$$\sqrt{3} \cot 2A = 1$$

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9. Calculate the value of A, if :

$$(\sin A - 1)(2 \cos A - 1) = 0$$

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10. Calculate the value of A, if :

$$(\tan A - 1)(\sec 3A - 1) = 0$$

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11. Calculate the value of A, if :

$$(\sec 2A - 1)(\csc 3A - 1) = 0$$

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12. Calculate the value of A, if :

$$\cos 3A \cdot (2 \sin 2A - 1) = 0$$

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13. Calculate the value of A, if :

$$(\csc 2A - 2)(\cot 3A - 1) = 0$$

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14. If $2\sin x^\circ - 1 = 0$ and x° is an acute angle, find:

(i) $\sin x^\circ$ (ii) x° (iii) $\cos x^\circ$ and $\tan x^\circ$.

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15. If $4\cos^2 x^\circ - 1 = 0$ and $0 \leq x^\circ \leq 90^\circ$, find :

x°

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16. If $4\cos^2 x^\circ - 1 = 0$ and $0 \leq x^\circ \leq 90^\circ$, find :

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

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17. If $4 \cos^2 x^\circ - 1 = 0$ and $0 \leq x^\circ \leq 90^\circ$, find :

$$\frac{1}{\cos^2 x^\circ} - \tan^2 x^\circ$$

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18. If $4 \sin^2 \theta - 1 = 0$ and angle θ is less than 90° , find the value of θ and hence the value of $\cos^2 \theta + \tan^2 \theta$.

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19. If $\sin 3A = 1$ and $0 \leq A \leq 90^\circ$, find :

$\sin A$

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20. If $\sin 3A = 1$ and $0 \leq A \leq 90^\circ$, find :

$\cos 2A$

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21. If $\sin 3A = 1$ and $0 \leq A \leq 90^\circ$, find :

$\tan^2 A - \frac{1}{\cos^2 A}$

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22. If $2 \cos 2A = \sqrt{3}$ and A is acute, find :

A

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23. If $2 \cos 2A = \sqrt{3}$ and A is acute, find :

$\sin 3A$

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24. If $2 \cos 2A = \sqrt{3}$ and A is acute, find :

$\sin^2(75^\circ - A) + \cos^2(45^\circ + A)$

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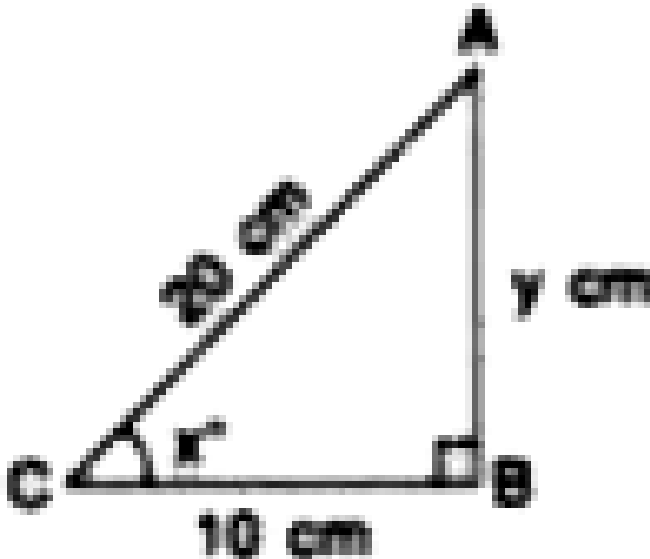
25. If $\sin x + \cos y = 1$ and $x = 30^\circ$, find the value of y .

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26. If $3 \tan A - 5 \cos B = \sqrt{3}$ and $B = 90^\circ$, find the value of A.

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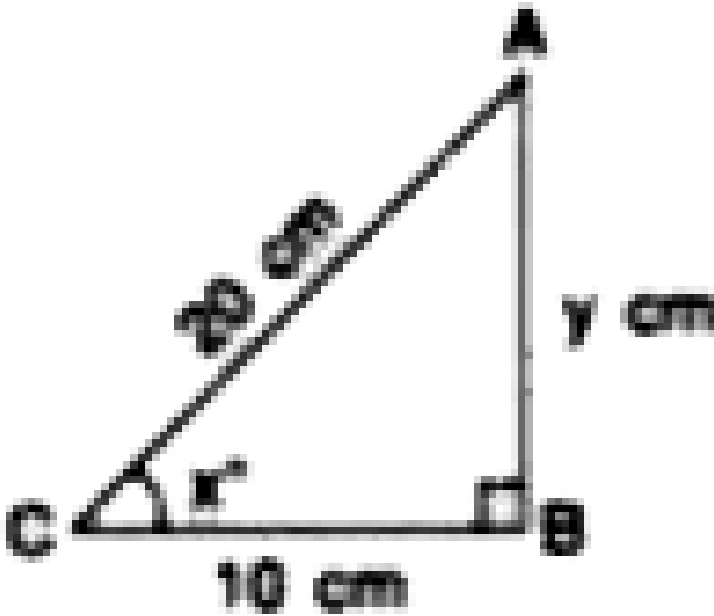
27. From the given figure, find :



$\cos x^\circ$

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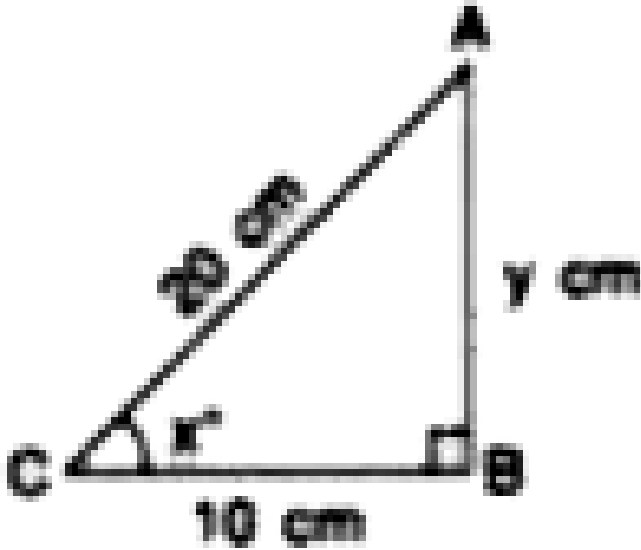
28. From the given figure, find :



x°

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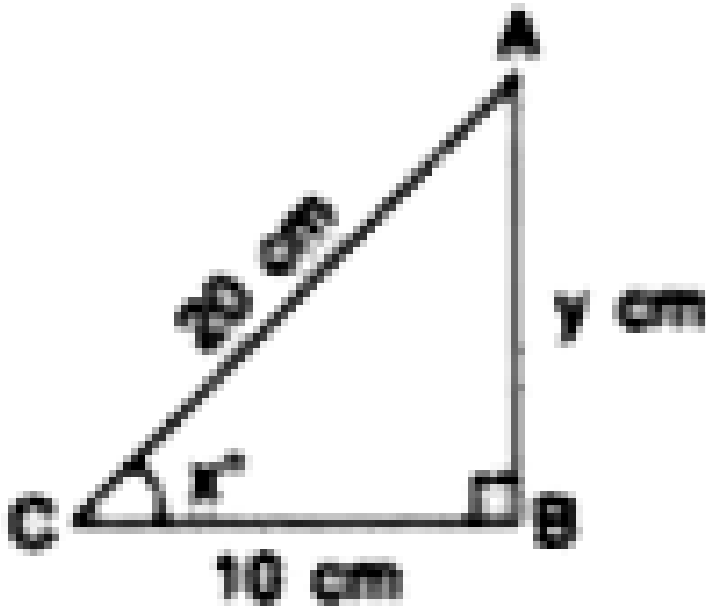
29. From the given figure, find :



$$\frac{1}{\tan^2 x^\circ} - \frac{1}{\sin^2 x^\circ}$$

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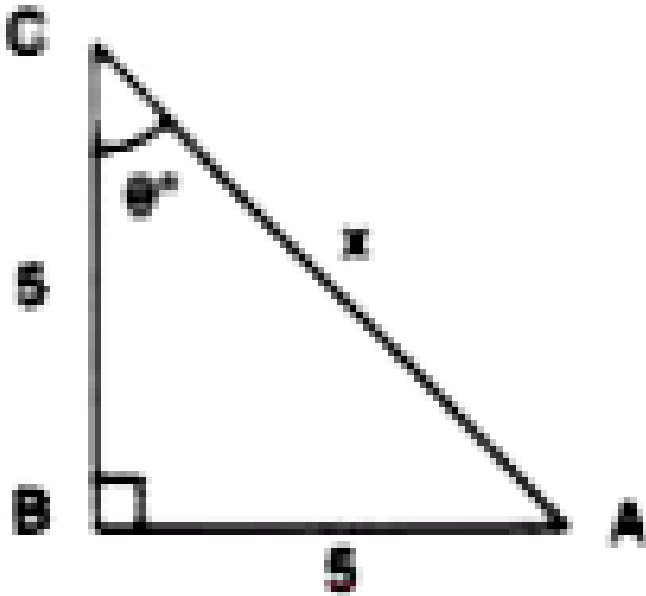
30. From the given figure, find :



Use $\tan x^\circ$, to find the value of y.

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31. Use the given figure to find :

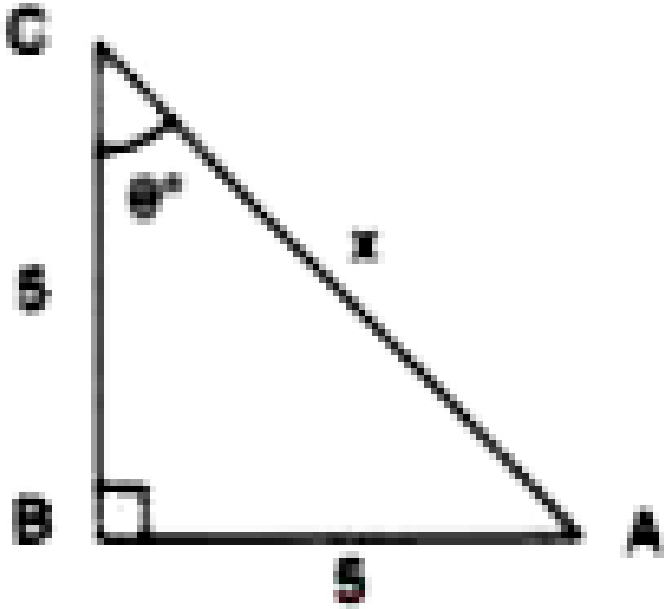


$\tan \theta^\circ$



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32. Use the given figure to find :

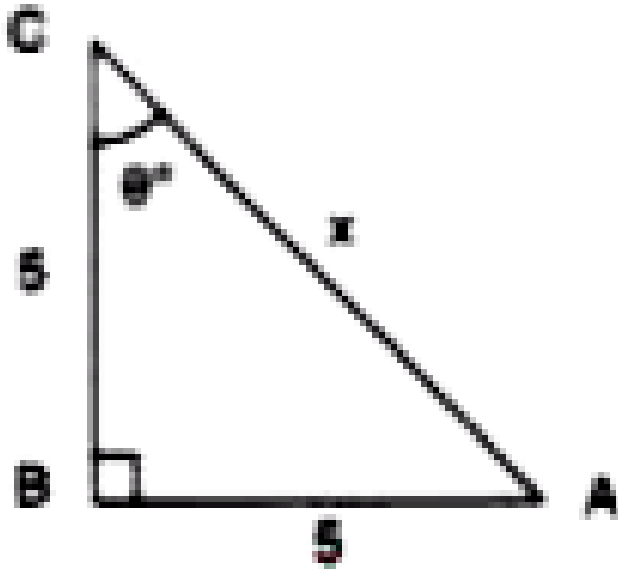


θ°



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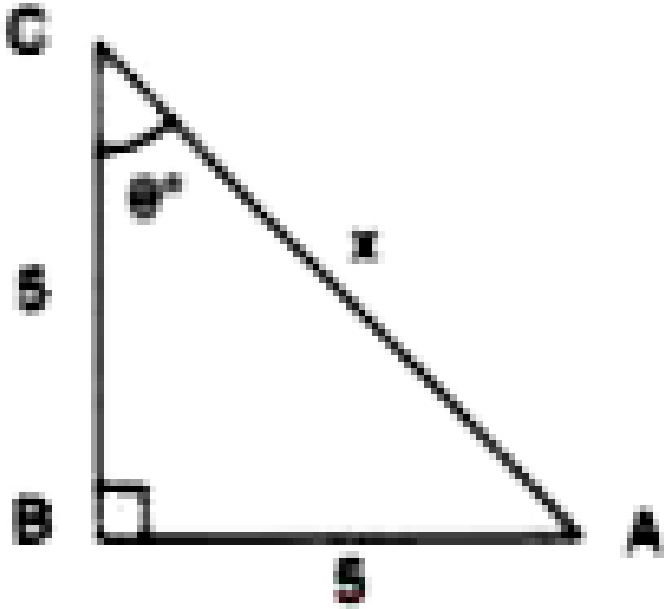
33. Use the given figure to find :



$$\sin^2 \theta^\circ - \cos^2 \theta^\circ$$

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34. Use the given figure to find :



θ°

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35. Find the magnitude of angle A, if :

$$2 \sin A \cos A - \cos A - 2 \sin A + 1 = 0$$

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36. Find the magnitude of angle A , if :

$$\tan A - 2 \cos A \tan A + 2 \cos A - 1 = 0$$



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37. Find the magnitude of angle A , if :

$$2 \cos^2 A - 3 \cos A + 1 = 0$$



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38. Find the magnitude of angle A , if :

$$2 \tan 3A \cos 3A - \tan 3A + 1 = 2 \cos 3A$$



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39. Solve for x :

$$2 \cos 3x - 1 = 0$$

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40. Solve for x :

$$\cos \frac{x}{3} - 1 = 0$$

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41. Solve for x :

$$\sin(x + 10^\circ) = \frac{1}{2}$$

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42. Solve for x :

$$\cos(2x - 30^\circ) = 0$$

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43. Solve for x :

$$2 \cos(3x - 15^\circ) = 1$$

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44. Solve for x :

$$\tan^2(x - 5^\circ) = 3$$

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45. Solve for x :

$$3 \tan^2(2x - 20^\circ) = 1$$



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46. Solve for x :

$$\cos\left(\frac{x}{2} + 10^\circ\right) = \frac{\sqrt{3}}{2}$$



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47. Solve for x :

$$\sin^2 x + \sin^2 30^\circ = 1$$



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48. Solve for x :

$$\cos^2 30^\circ + \cos^2 x = 1$$



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49. Solve for x :

$$\cos^2 30^\circ + \sin^2 2x = 1$$



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50. Solve for x :

$$\sin^2 60^\circ + \cos^2(3x - 9^\circ) = 1$$



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51. If $4 \cos^2 x = 3$ and x is an acute angle, find the value of

:

x

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52. If $4 \cos^2 x = 3$ and x is an acute angle, find the value of

:

$\cos^2 x + \cot^2 x$

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53. If $4 \cos^2 x = 3$ and x is an acute angle, find the value of

:

$\cos 3x$

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54. If $4 \cos^2 x = 3$ and x is an acute angle, find the value

of :

$\sin 2x$

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55.

In

$\triangle ABC$, $\angle B = 90^\circ$), $AB = y$ units, $BC = \sqrt{3}$ units,

$AC = 2$ units and angle $A = x^\circ$, find :

$\sin x^\circ$

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56. In

$\Delta ABC, (\angle B = 90^\circ), AB = y$ units, $BC = \sqrt{3}$ units,

$AC = 2$ units and angle $A = x^\circ$, find :

x°

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57. In

$\Delta ABC, (\angle B = 90^\circ), AB = y$ units, $BC = \sqrt{3}$ units,

AC = 2 units and angle $A = x^\circ$, find :

$\tan x^\circ$

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58. In

ΔABC , $\angle B = 90^\circ$), $AB = y$ units, $BC = \sqrt{3}$ units,

AC = 2 units and angle $A = x^\circ$, find :

use $\cos x^\circ$ to find the value of y .

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59. If $2 \cos(A + B) = 2 \sin(A - B) = 1$, find the values of

A and B.

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60. Solve the following equations for A, if :

$$2 \sin A = 1$$

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61. Solve the following equations for A, if :

$$2 \cos 2A = 1$$

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62. Solve the following equations for A, if :

$$\sin 3A = \frac{\sqrt{3}}{2}$$

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63. Solve the following equations for A, if :

$$\sec 2A = 2$$



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64. Solve the following equations for A, if :

$$\sqrt{3} \tan A = 1$$



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65. Solve the following equations for A, if :

$$\tan 3A = 1$$



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66. Solve the following equations for A, if :

$$2 \sin 3A = 1$$

 [Watch Video Solution](#)

67. Solve the following equations for A, if :

$$\sqrt{3} \cot 2A = 1$$

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68. Calculate the value of A, if :

$$(\sin A - 1)(2 \cos A - 1) = 0$$

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69. Calculate the value of A, if :

$$(\tan A - 1)(\sec 3A - 1) = 0$$

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70. Calculate the value of A, if :

$$(\sec 2A - 1)(\sec 3A - 1) = 0$$

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71. Calculate the value of A, if :

$$\cos 3A. (2 \sin 2A - 1) = 0$$

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72. Calculate the value of A, if :

$$(\operatorname{cosec} 2A - 2)(\cot 3A - 1) = 0$$

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73. If $2\sin x^\circ - 1 = 0$ and x° is an acute angle, find:

(i) $\sin x^\circ$ (ii) x° (iii) $\cos x^\circ$ and $\tan x^\circ$.

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74. If $4\cos^2 x^\circ - 1 = 0$ and $0 \leq x^\circ \leq 90^\circ$, find :

x°

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75. If $4 \cos^2 x^\circ - 1 = 0$ and $0 \leq x^\circ \leq 90^\circ$, find :

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

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76. If $4 \cos^2 x^\circ - 1 = 0$ and $0 \leq x^\circ \leq 90^\circ$, find :

$$\frac{1}{\cos^2 x^\circ} - \tan^2 x^\circ$$

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77. If $4 \sin^2 \theta - 1 = 0$ and angle θ is less than 90° , find the value of θ and hence the value of $\cos^2 \theta + \tan^2 \theta$.

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78. If $\sin 3A = 1$ and $0 \leq A \leq 90^\circ$, find :

$\sin A$

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79. If $\sin 3A = 1$ and $0 \leq A \leq 90^\circ$, find :

$\cos 2A$

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80. If $\sin 3A = 1$ and $0 \leq A \leq 90^\circ$, find :

$\tan^2 A - \frac{1}{\cos^2 A}$

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81. If $2 \cos 2A = \sqrt{3}$ and A is acute, find :

A

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82. If $2 \cos 2A = \sqrt{3}$ and A is acute, find :

$\sin 3A$

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83. If $2 \cos 2A = \sqrt{3}$ and A is acute, find :

$\sin^2(75^\circ - A) + \cos^2(45^\circ + A)$

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84. If $\sin x + \cos y = 1$ and $x = 30^\circ$, find the value of y .



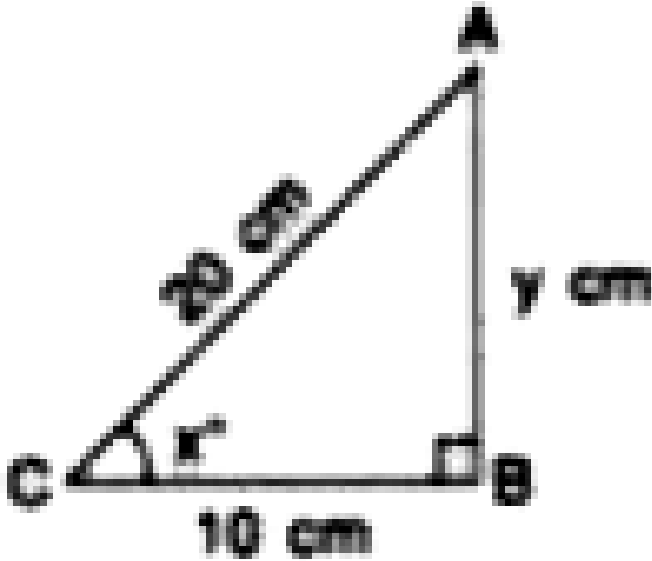
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85. If $3 \tan A - 5 \cos B = \sqrt{3}$ and $B = 90^\circ$, find the value of A .



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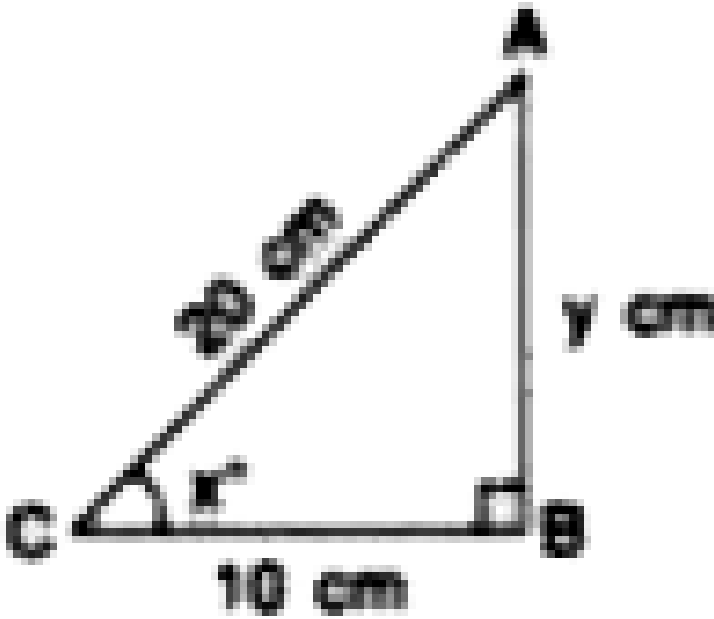
86. From the given figure, find :



$\cos x^\circ$

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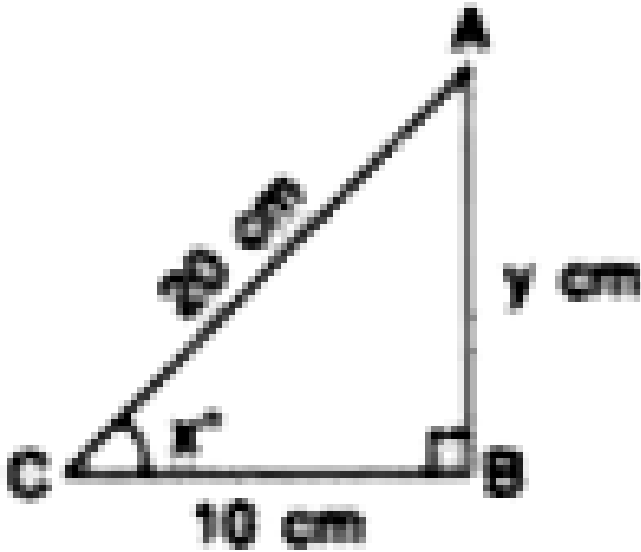
87. From the given figure, find :



x°

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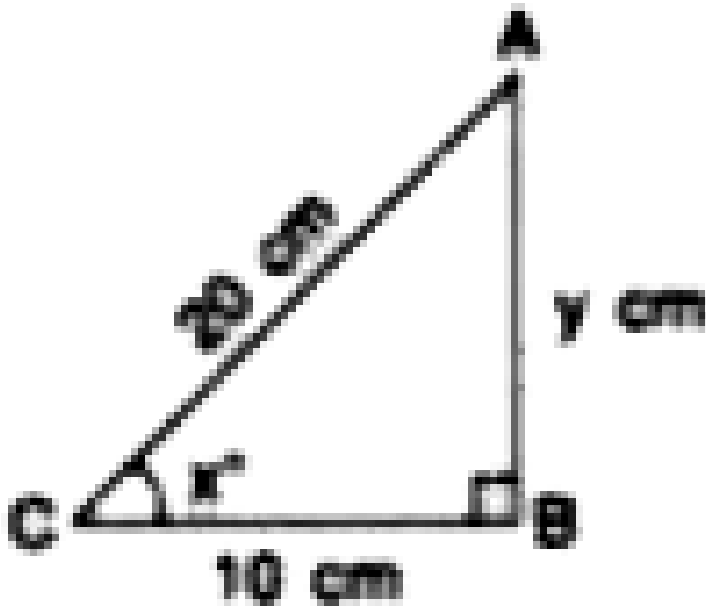
88. From the given figure, find :



$$\frac{1}{\tan^2 x^\circ} - \frac{1}{\sin^2 x^\circ}$$

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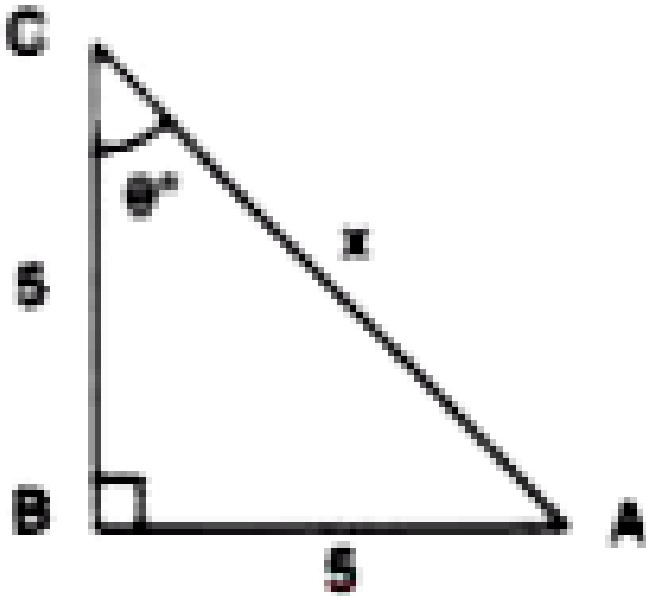
89. From the given figure, find :



Use $\tan x^\circ$, to find the value of y .

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90. Use the given figure to find :

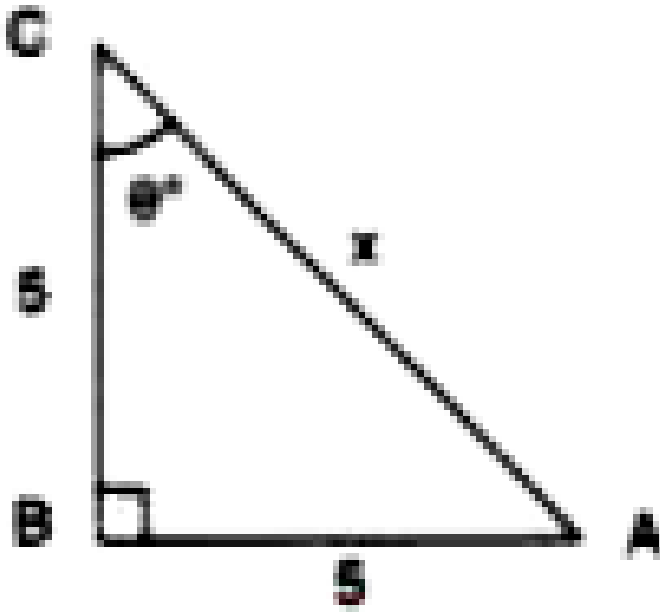


$\tan \theta^\circ$



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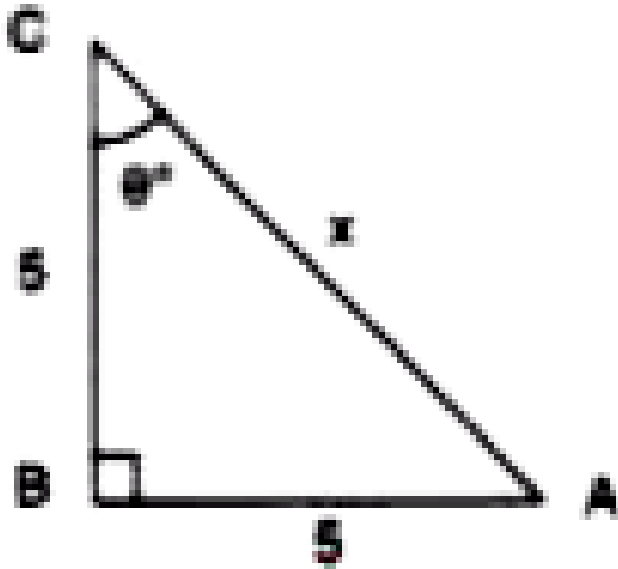
91. Use the given figure to find :



θ°

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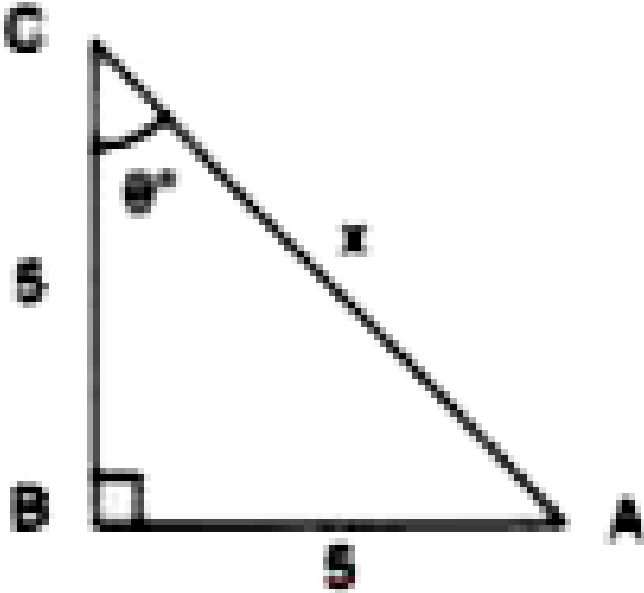
92. Use the given figure to find :



$$\sin^2 \theta^\circ - \cos^2 \theta^\circ$$

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93. Use the given figure to find :



Use $\sin \theta^\circ$ to find the value of x .

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94. Find the magnitude of angle A , if :

$$2 \sin A \cos A - \cos A - 2 \sin A + 1 = 0$$

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95. Find the magnitude of angle A , if :

$$\tan A - 2 \cos A \tan A + 2 \cos A - 1 = 0$$

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96. Find the magnitude of angle A , if :

$$2 \cos^2 A - 3 \cos A + 1 = 0$$

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97. Find the magnitude of angle A , if :

$$2 \tan 3A \cos 3A - \tan 3A + 1 = 2 \cos 3A$$

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98. Solve for x :

$$2 \cos 3x - 1 = 0$$



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99. Solve for x :

$$\cos \frac{x}{3} - 1 = 0$$



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100. Solve for x :

$$\sin(x + 10^\circ) = \frac{1}{2}$$



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101. Solve for x :

$$\cos(2x - 30^\circ) = 0$$



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102. Solve for x :

$$2 \cos(3x - 15^\circ) = 1$$



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103. Solve for x :

$$\tan^2(x - 5^\circ) = 3$$



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104. Solve for x :

$$3 \tan^2(2x - 20^\circ) = 1$$



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105. Solve for x :

$$\cos\left(\frac{x}{2} + 10^\circ\right) = \frac{\sqrt{3}}{2}$$



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106. Solve for x :

$$\sin^2 x + \sin^2 30^\circ = 1$$



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107. Solve for x :

$$\cos^2 30^\circ + \cos^2 x = 1$$



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108. Solve for x :

$$\cos^2 30^\circ + \sin^2 2x = 1$$



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109. Solve for x :

$$\sin^2 60^\circ + \cos^2(3x - 9^\circ) = 1$$



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110. If $4 \cos^2 x = 3$ and x is an acute angle, find the value of:

x

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111. If $4 \cos^2 x = 3$ and x is an acute angle, find the value of:

$\cos^2 x + \cot^2 x$

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112. If $4 \cos^2 x = 3$ and x is an acute angle, find the value of:

$\cos 3x$

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113. If $4 \cos^2 x = 3$ and x is an acute angle, find the value of:

$\sin 2x$

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114.

In

$\triangle ABC$, $\angle B = 90^\circ$), $AB = y$ units, $BC = \sqrt{3}$ units,

$AC = 2$ units and angle $A = x^\circ$, find :

$\sin x^\circ$

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115.

In

ΔABC , $\angle B = 90^\circ$), $AB = y$ units, $BC = \sqrt{3}$ units,

$AC = 2$ units and angle $A = x^\circ$, find :

x°

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116.

In

ΔABC , $\angle B = 90^\circ$), $AB = y$ units, $BC = \sqrt{3}$ units,

$AC = 2$ units and angle $A = x^\circ$, find :

x°

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117.

In

ΔABC , $\angle B = 90^\circ$), $AB = y$ units, $BC = \sqrt{3}$ units,

$AC = 2$ units and angle $A = x^\circ$, find :

use $\cos x^\circ$ to find the value of y .

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118. If $2 \cos(A + B) = 2 \sin(A - B) = 1$, find the values of

A and B.

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