MATHS

BOOKS - SWAN PUBLICATION

INTRODUCTION TO TRIGONOMETRY

Exercise 8 1

1. In $\triangle ABC$, right angled at B, AB = 24 cm ,BC = 7 cm.

Determine :- sinA, cosA.

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2. In $\triangle ABC$, right angled at B, AB = 24 cm ,BC = 7 cm.

Determine :- sinC, cosC.

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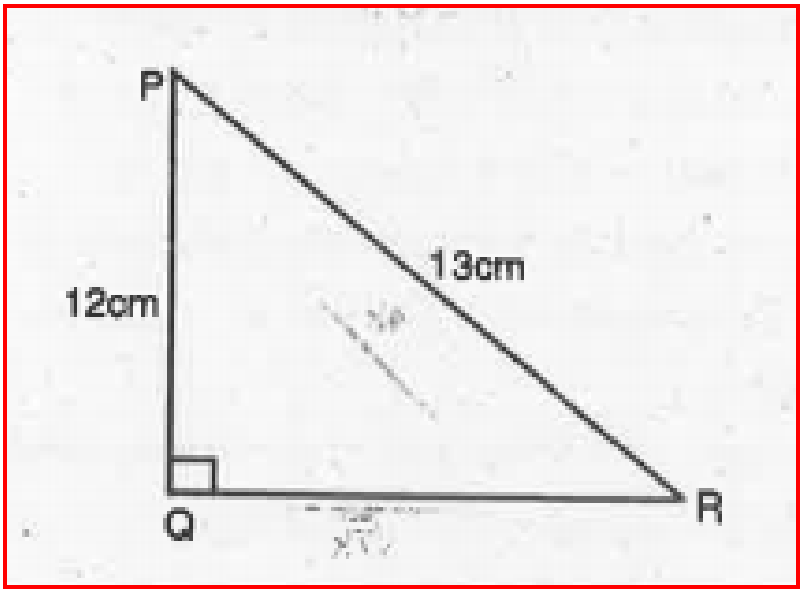
3. In fig., find tan P - cot R.



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4. If sin A = $\frac{3}{4}$ calculate cos A and tanA.

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5. Given 15 cot A =8, find sin A and sec A.

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6. Given $\sec\theta = \frac{13}{12}$, calculate all other trigonometric ratios.

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7. if $\angle A$ and $\angle B$ are acute angles such that cos A = cos B , show that $\angle A = \angle B$.

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8. If $\cot\theta = \frac{7}{8}$ evaluate :- $\frac{(1+\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}$.

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9. If $\cot\theta = \frac{7}{8}$ evaluate :- $\cot^2\theta$.

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10. If 3cotA=4, check whether 1-tan ^2 A/ 1+tan ^2 A =cos ^2 A−sin ^2 A or not

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11. In triangle ABC, right angled at B, if tan A = $\frac{1}{\sqrt{3}}$. Find the value of :- sin A cos C + cos A sin C.

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12. In triangle ABC, right angled at B, if tan A = $\frac{1}{\sqrt{3}}$. Find the value of :- cos A cos C -sin A sin C.

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13. In $\triangle PQR$, right angled at Q, PR + QR = 25 cm and PQ = 5 cm. Determine the values of sin P, cos P and tan P.

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14. State whether the following are true or false. Justify your answer. :- The value of tan A is always less than 1.

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15. State whether the following are true or false. Justify your answer. :- sec A = $\frac{12}{5}$ for some value of angle A.

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16. State whether the following are true or false. Justify your answer. :- cos A is abbreviation used for cosecant of angle A.

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17. State whether the following are true or false. Justify your answer. :- cot A is product of cot and A.

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18. State whether the following are true or false. Justify your answer. :-$\sin = \frac{4}{3}$ for some angle θ .

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Exercise 8 2

1. Evaluate the following :

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

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2. Evaluate The following : $2\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$

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3. Evaluate The following : $\frac{\cos 45^\circ}{\sec 30^\circ + \cos ec30^\circ}$

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

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5. Evaluate The following :

$$\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$$

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6. If tan(A+B)=$\sqrt{3}$ and tan(A-B)=$\frac{1}{\sqrt{3}}$, $0^\circ \angle A + B \leq 90^\circ$,

A>B, find A and B .

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7. State whetherthe following are true or false. Justify your answer. :- sin (A+B)=sinA+sinB.

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8. Stare whether the Following is true or false. Justify your answer:- The value of sin θ increases as θ increases.

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9. Stare whether the Following is true or false. Justify your answer:- The value of cos θ increases as θ increases.

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10. Stare whether the Following is true or false. Justify your answer:- $\sin\theta = \cos\theta$ for all values of θ.

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11. State whetherthe following are true or false. Justify your answer. :- cot A is not defined for A =0° .

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Exercise 8 2 Choose The Correct Option And Justify Your Choice

1. Choose the correct option and justify your choice.:- $\frac{2\tan 30^\circ}{1+\tan^2 30^\circ}$.

A. $\sin 60^\circ$

B. $\cos 60^\circ$

C. $\tan 60^\circ$

D. $\sin 30^\circ$

Answer: A

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2. $\dfrac{1-\tan^2 45^\circ}{1+\tan^2 45^\circ} =$

A. $\tan 90^\circ$

B. 1

C. $\sin 45^\circ$

D. 0

Answer: D

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3. Choose the correct option and justify your choice.:- sin 2A = 2 sin A is true when A

A. 0°

B. 30°

C. 45°

D. 60°

Answer: A

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4. Choose the correct option and justify your choice.:-

$$\frac{2\tan 30^\circ}{1-\tan^2 30^\circ}.$$

A. $\cos 60^\circ$

B. $\sin 60^\circ$

C. $\tan 60^\circ$

D. $\sin 30^\circ$

Answer: C

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Exercise 8 3

1. Evaluate : $\frac{\sin 18^\circ}{\cos 72^\circ}$.

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2. Evaluate : $\frac{\tan 26^\circ}{\cot 64^\circ}$.

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3. Evaluate : $\cos 48^\circ - \sin 42^\circ$.

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4. Evaluate : $cosec 31^\circ - \sec 59^\circ$.

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5. Show that : $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ = 1$.

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6. Show that : $\cos 38^\circ \cos 52^\circ - \sin 38^\circ \sin 52^\circ = 0$.

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7. If $\tan 2A = \cot(A - 18^\circ)$, where 2A is an acute angle, find the value of A.

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8. If tanA=cotB, prove that A+B=90° .

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9. If $\sec 4A = \cos ec(A - 20^\circ)$, where 4A is an acute angle, find the value of A.

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10. If A, B and C are interior angles of a triangle ABC, then show that $\sin\left(\frac{B+C}{2}\right) = \cos\frac{A}{2}$.

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11. Expresssin 67° + cos 75° in terms of Trigonometric ratios of angles between 0° and 45°.

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Exercise 8 4

1. Express the trigonometric ratios sin A, sec A and tan A In terms of cot A.

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2. Write all the other trigonometric ratios of $\angle$A in terms of sec A.

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3. Evaluate :- $\frac{\sin^2 63^\circ + \sin^2 27^\circ}{\cos^2 17^\circ + \cos^2 73^\circ}$.

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4. Evaluate :- $\sin 25^\circ \cos 65^\circ + \cos 25^\circ \sin 65^\circ$.

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5. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. : $(\operatorname{cosec}\theta - \cot\theta)^2 = \frac{1-\cos\theta}{1+\cos\theta}$.

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6. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. :

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

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7. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. :

$$\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta\cos ec\theta\,.$$

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8. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. :

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

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9. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. : $\frac{\cos A-\sin A+1}{\cos A+\sin A-1}=\cos ecA+\cot A,$ using the identity $\cos es^2 A=1+\cot^2 A)$

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10. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. : $\sqrt{\frac{1+\sin A}{1-\sin A}}=\sec A+\tan A\,.$

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11. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. :

$$\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta .$$

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12. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. :

$$(\sin A + \cos ecA)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$$

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13. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. $(\cos ecA - \sin A)(\sec A - \cos A) = \dfrac{1}{\tan A + \cot A}$ [Hint :Simplify LHS and RHS separately]

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14. Prove the following identities, where the angles involved are acute angles for which the expressions are defined. : $\left(\dfrac{1+\tan^2 A}{1+\cot^2 A}\right) = \left(\dfrac{1-\tan A}{1-\cot A}\right)^2 = \tan^2 A$.

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Exercise 8 4 Choose The Correct Option And Justify Your Choice

1. Choose the correct option. Justify your choice :

$9\sec^2 A - 9\tan^2 A =$ a. 1 b. 9 c. 8 d. 0

A. 1

B. 9

C. 8

D. 0

Answer: B

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2. Choose the correct option. Justify your choice :

$(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \cos ec\theta)$

A. 0

B. 1

C. 2

D. -1

Answer: C

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3. $(\sec A + \tan A)(1 - \sin A) =$

A. $\sec A$

B. $\sin A$

C. $\text{cosec}A$

D. $\cos A$

Answer: D

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4. Choose the correct option. Justify your choice : $\frac{1+\tan^2 A}{1+\cot^2 A}$ a. $\sec^2 A$ b. -1 c. $\cot^2 A$ d. $\tan^2 A$

A. $\sec^2 A$

B. -1

C. $\cot^2 A$

D. $\tan^2 A$

Answer: D

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