MATHS

BOOKS - OSWAAL PUBLICATION MATHS (KANNADA ENGLISH)

INTRODUCTION TO TRIGONOMETRY

Topic 1 Trigonometric Ratios Complementary Angles Value Multiple Choice Questions

1. If 2 cos θ=1 and θ Is an Acute then the value of 'θ' is:

A. 0°

B. 30°

C. 45°

D. 60°

Answer: D

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2. The value of $\tan^2 60^\circ$ is:

A. $\sqrt{3}$

B. $2\sqrt{3}$

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

D. 3

Answer: D

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3. $\left(1+\tan^2 60^\circ\right)^2$ is equal to:

A. 1

B. 2

C. 16

D. 4

Answer: C

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4. If $1-\cos^2\theta=\frac{3}{4}$,then $\sin\theta$ is:

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

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

C. 1

D. 0

Answer: A

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5. The value of $\tan\theta \cot\theta$ is:

A. 0

B. 1

C. $\frac{1}{\cot\theta}$

D. $\frac{1}{\tan\theta}$

Answer: B

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6. If $\tan x = \frac{7}{24}$,then cot x is :

A. 7

B. 24

C. $\frac{7}{24}$

D. $\frac{24}{7}$

Answer: D

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7. If $\sec(\theta + 36^\circ)$=cosec θ the θ is equal to:

A. 36°

B. 54°

C. 63°

D. 27°

Answer: D

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8. If 3x=secθ, $\frac{3}{x}$ =tan$\theta then$(x^(2)-(1)/(x^(2)))` I equal to:

A. 9

B. 3

C. $\frac{1}{9}$

D. 1

Answer: C

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9. The value of $\sin^2 60^\circ - \sin^2 30^\circ$ is:

A. $\frac{1}{4}$

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

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

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

Answer: B

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10. If sec 2A=cosec $(A-27^\circ)$,where 2A Is an acute angle,then the measure of $\angle A$ is:

A. 35°

B. 37°

C. 39°

D. 21°

Answer: C

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11. Given that $\sin\theta = \frac{a}{b}$,then tan θ is equal to :

A. $\frac{b}{\sqrt{a^2+b^2}}$

B. $\frac{b}{\sqrt{a^2-b^2}}$

C. $\frac{a}{\sqrt{a^2-vb^2}}$

D. $\frac{a}{\sqrt{b^2-a^2}}$

Answer: d

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12. If sin θ=cosθ,then the value of 2tan $\theta + \cos^2\theta$ is:

A. 1

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

C. $\frac{5}{2}$

D. $\frac{2}{5}$

Answer: C

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13. If cosec θ=2 cot$\theta = \sqrt{3}$p,where 'θ' is an acute angle,then the value of p is:

A. 2

B. 1

C. 0

D. $\sqrt{3}$

Answer: B

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14. The maximum value of $\sin\theta$ is:

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

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

C. 1

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

Answer: C

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15. If $\tan\theta = \frac{7}{8}$,then the value of $\frac{(1+si\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}$ is:

A. $\frac{7}{8}$

B. $\frac{8}{7}$

C. $\frac{64}{49}$

D. $\frac{49}{64}$

Answer: C

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16. If 5 tan=θ=4,then the value of $\frac{5\sin\theta - 3\cos\theta}{5\sin\theta + 3\cos\theta}$ is:

A. 0

B. 1

C. $\frac{1}{7}$

D. $\frac{2}{7}$

Answer: C

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17. If $5\tan\theta=12$,then $\frac{13\sin\theta}{3}$ is:

A. 2

B. 4

C. 12

D. 1

Answer: B

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18. The value of $\frac{2\tan 30^\circ}{1+\tan^2 30^\circ}$ is :

A. $\sin 60^\circ$

B. $\cos 60^\circ$

C. $\tan 60^\circ$

D. $\sin 30^\circ$

Answer: A

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19. If A,B and C are interior angles of a ΔABC,then $\tan\frac{A+B}{2}$ is equal to :

A. $\sin\left(\frac{C}{2}\right)$

B. $\cos\left(\frac{C}{2}\right)$

C. $\cot\left(\frac{C}{2}\right)$

D. $\tan\left(\frac{C}{2}\right)$

Answer: C

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20. If $\sin(x-20)^\circ = \cos(3x-10)^\circ$, then x is :

A. 60

B. 30

C. 46

D. 35.5

Answer: B

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21. In a right triangle ABC right angled at C,if tan A=$\frac{8}{15}$,then the value of $\cos ec^2 A - 1$ i:

A. $\frac{64}{225}$

B. $\frac{225}{64}$

C. $\frac{289}{4}$

D. 0

Answer: B

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22. If tan x =sin 45° cos 45° cos $45^\circ + \sin 30^\circ$,then x is equal to:

A. 45°

B. 90°

C. 0°

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

Answer: A

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23. Maximum value of $\frac{1}{\sec\theta}, 0^\circ \leq \theta \leq 90^\circ$ is:

A. 1

B. 2

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

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

Answer: A

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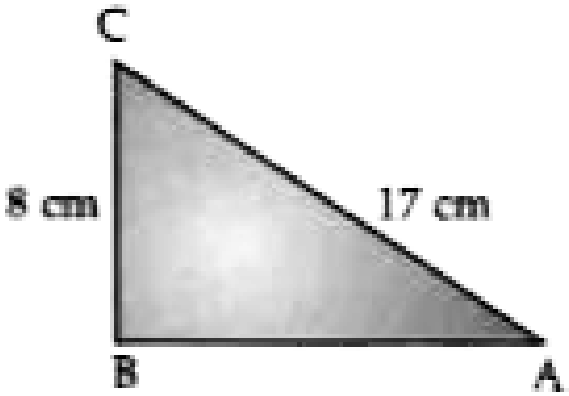
24. In the given figure ,ABC is right angles at B.It AC=17cm and BC=8cm,then 15 sec A+8 cot A is:



A. 23

B. 32

C. 120

D. 27

Answer: B

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25. If $\sin A = \frac{1}{2\tan^2 45^\circ}$,where 'A' is an acute angle,then the value of A is:

A. 60°

B. 45°

C. 30°

D. 15°

Answer: C

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26. The value of $\cos^2 17^\circ - \sin^2 73^\circ$ is:

A. 1

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

C. 0

D. -1

Answer: C

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27. If $A = 30^\circ$,then sin 2A equals :

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

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

C. $\frac{1}{\sqrt{2}}$

D. 1

Answer: B

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28. The value of $\sin 45^\circ + \cos 45^\circ$ is :

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

B. $\sqrt{2}$

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

D. 1

Answer: B

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29. In ΔABC right angled at C,the value of $\cos(A+B)$ is:

A. 0

B. 1

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

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

Answer: A

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30. Sin $(45^\circ + \theta) - \cos(45^\circ - \theta)$ is equal to :

A. $2\cos\theta$

B. 1

C. $2\sin\theta$

D. 0

Answer: D

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31. $\sin 2A = 2\sin A$ is true when A = ?

A. 60°

B. 45°

C. 30°

D. 0°

Answer: D

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32. If tan 3A=cot $(A - 26^\circ), 3A < 90^\circ$,then the value of A is:

A. 26°

B. 29°

C. 16°

D. 58°

Answer: B

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33. If $\cos 2\theta = \sin 4\theta$,where 2θ and 4θ are acute angles,then the value of θ is:

A. 15°

B. 30°

C. 45°

D. 60°

Answer: A

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34. tan θ is not defined ,when θ is equal to :

A. 0°

B. 30°

C. 60°

D. 90°

Answer: D

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35. The value of $\cos 48^\circ \cos 42^2 - \sin 48^\circ \sin 42^\circ$ is:

A. 1

B. 0

C. 90

D. 4

Answer: B

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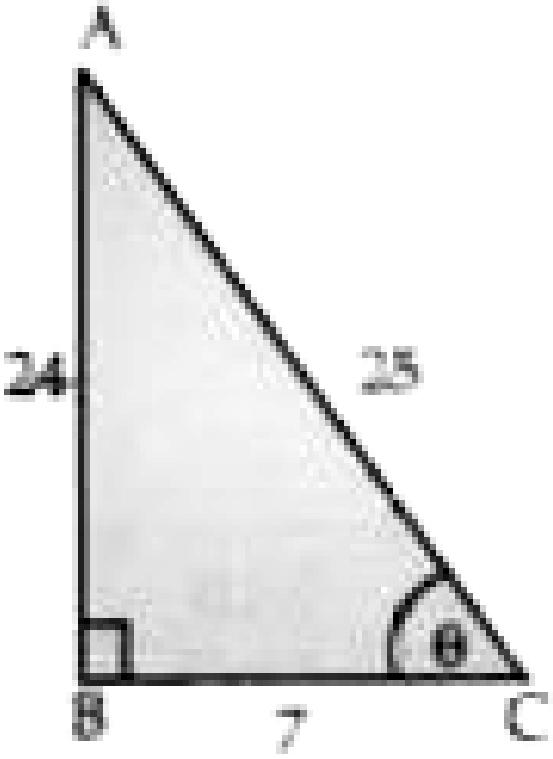
Topic 1 Trigonometric Ratios Complementary Angles Value Very Short Answer Type Questions

1. Find sin θ and cos θ using the following figure.If AB=24 units ,AC=25 units and BC=7units.



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2. Find the value of of:$\sin 12^\circ - \cos 78^\circ$.

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3. Find the value of : $\frac{\sec 41^\circ}{\cos ec 49^\circ}$

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4. Find the reciproacal ratio of cos (90-x)

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5. Find the value of $\sin 55^\circ - \cos 35^\circ$?

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6. Find the value of $\sin^2 20^\circ + \sin^2 70^\circ$

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7. If sin $(\theta + 36^\circ)$=cosθ find the value θ

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8. In ΔABC if A+B=90° ,then find the value of cos C.

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Topic 1 Trigonometric Ratios Complementary Angles Value Short Answer Type Question

1. If B=15° ,then prove that 4 sin 2B.cos 4B.sin6B=1.

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2. If 24 $\tan\theta=7$,then find (i) $\sin\theta$ (ii) $\cos\theta$

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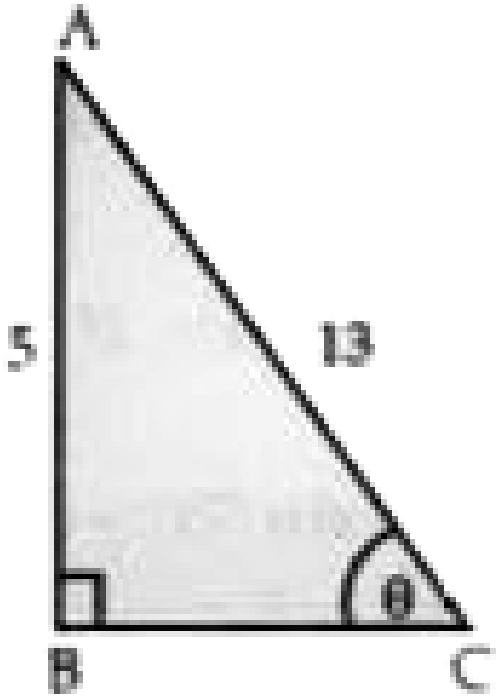
3. In the given figure,find the value of $\cos\theta$ and $\tan\theta$.



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4. Find the value of $\frac{4\sin^2 60^\circ - \cos^2 45^\circ}{\tan^2 30^\circ + \sin^2 0^\circ}$

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5. If $\sin\theta = \frac{5}{13}$ then write the value of $\cos ec\theta$

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6. Evaluate the following:

(ii) $2\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$

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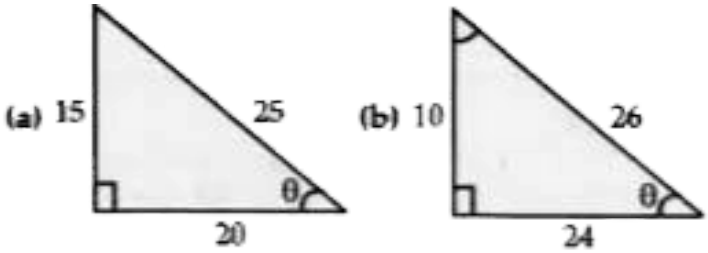
7. Find sin θ and cos θ for the following:



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8. Solve :

(a)Given tan A=$\frac{3}{4}$, find the value of sin A and cos A.

(b)Given cot $\theta = \frac{20}{21}$,determine cos θ and cosec θ.

(C) If 13 sin A=4 and θ A is acute find the value of

$$\frac{5\tan\theta + 12\cot\theta}{5\tan\theta - 12\cot\theta}$$

(e) If 13 cos θ-5 0 ,find $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta}$

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Topic 1 Trigonometric Ratios Complementary Angles Value Long Answer Type Questions I

1. Prove that:

$$\sin^2 30^\circ \cos^2 45^\circ + 4\tan^2 30^\circ + \frac{1}{2}\sin^2 90^\circ + \frac{1}{8}\cot^2 60^\circ = 2$$

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2. If $x = 180^\circ$,A $= \frac{\pi}{3}$ and $B = \frac{\pi}{6}$ Prove that tan(A-B)= $\frac{\tan A - \tan B}{1 + \tan A \tan B}$

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3. Find the following :

(a) If $\sin x = \frac{3}{5}$, cosecx=

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4. Find the following :

(b) If cos x=$\frac{24}{25}$,sec x=

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5. Find the following :

(c)If tan x=$\frac{7}{24}$,cot x=

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6. Find the following :

(d)If cosec x $= \frac{25}{15}$, sin x=

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7. Find the following :

(e)If sin A=$\frac{4}{5}, \frac{2}{3}$ $\sin A$=

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8. Find the following :

$A = \frac{8}{15}$ and sin $A = \frac{15}{17}$ then,

Cos A=

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Topic 1 Trigonometric Ratios Complementary Angles Value Long Answer Type Question Ii

1. Answer the following questions:

(a)What trigonometic ratios of angles from 0° to 90° are equal to 0 ?

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2. Which triagonometric ratio of angles from 0° to 90° are equal to 1?

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3. Which trigonometric ratio of angles from 0° to 90° are equal to 0.5 ?

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4. Which trigonometric ratios of angles from 0° to 90° are not defied?

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5. Evalute:

(a) $\frac{\tan 65^\circ}{\cot 25^\circ}$

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6. Evalute:

(b) $\frac{\sin 18^\circ}{\cos 72^\circ}$

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7. Evalute

(c)$\cos 48^\circ - \sin 42^\circ$

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8. Evaluate:

(iv) $\cos ec31^\circ - \sec 59^\circ$

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9. Evalute

(e) $\cot 34^{\circ} - \tan 56^{\circ}$

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10. Evalute

(f) $\frac{\sin 36^{\circ}}{\cos 54^{\circ}} - \frac{\sin 54^{\circ}}{\cos 36^{\circ}}$

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11. Evalute

(g) $\sec 70^{\circ} \sin 20^{\circ} - \cos 70^{\circ} \cos ec 20^{\circ}$

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12. Evalute

(h) $\cos^2 13^\circ - \sin^2 77^\circ$

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13. If $4\sin\theta = 3$,find the value of x if

$$\sqrt{\frac{\cos ec^2\theta - \cot^2\theta}{\sec^2\theta - 1}} + 2\cot\theta = \frac{\sqrt{7}}{x} + \cos\theta$$

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14. If $\sqrt{3}\cot^2\theta - 4\cot\theta + \sqrt{3} = 0$,tehn find the value of $\cot^2\theta + \tan^2\theta$

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Topic 2 Trigonometric Identities Multiple Choice Questions

1. $(1+\cos\theta)(1-\cos\theta)$ is equal to:

A. $\sin^2\theta$

B. $\tan^2\theta$

C. 1

D. 0

Answer: A

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2. Sin A.cos A.tanA+cosA.sinA.cotA is equal to:

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

B. $\tan^2 A + \cot^2 A$

C. $\sin^2 A + \cos^2 A$

D. $\sin^2 A + \tan^2 A$

Answer: C

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3. The value of $\cot^2 \theta - \frac{1}{\sin^2 \theta}$ is:

A. 0

B. 1

C. 1

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

Answer: B

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4. If $\sec\theta + \tan\theta + 1 = 0$,then $\sec\theta - \tan\theta$ is:

A. -1

B. 1

C. 0

D. 2

Answer: A

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5. If x=acos θ,y=b sin θ, $then$b^(2)x^(2)+a^(2)y^(2)-a^(2)b^(2)` is equal to:

A. 1

B. -1

C. 0

D. 2ab

Answer: C

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6. If cosec $\theta - \cot\theta = \frac{1}{4}$,then the value of cosec $\theta + \cot\theta$ is:

A. 4

B. $\frac{1}{4}$

C. 1

D. -1

Answer: A

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7. The value of $\left(\frac{11}{\cot^2\theta} - \frac{11}{\cos^2\theta}\right)$ is :

A. 11

B. 0

C. $\frac{1}{11}$

D. -11

Answer: D

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8. It $\tan\theta + \cot\theta = 5$,then the value of $\tan^2\theta + \cot^2\theta$ is:

A. 23

B. 25

C. 27

D. 15

Answer: A

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9. $\cos^2\theta + \sin^2\theta$ is:

A. x

B. 1

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

D. x^2

Answer: B

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10. $\frac{1 - \sec^2 A}{\cos ec^2 A - 1}$ equals:

A. $-\sec^2 A$

B. $\tan^4 A$

C. $-\tan^4 A$

D. 1

Answer: C

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11. $\frac{\sin\theta}{1+\cos\theta}$ is:

A. $\frac{\coth\eta}{1-\sin\theta}$

B. $\frac{1-\cos\theta}{\sin\theta}$

C. $\frac{1-\sin\theta}{\cos\theta}$

D. $\frac{1-\cos\theta}{1+\cos\theta}$

Answer: B

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12. (SecA+tanA)(1-sinA) on simplification gives:

A. $\tan^2 A$

B. $\sec^2 A$

C. cos A

D. sin A

Answer: C

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Topic 2 Trigonometric Identities Very Short Answer Type Questions

1. Find the value of :$\sec^2\theta - \cot^2(90^\circ - \theta)$.

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2. If $\sec\theta + \tan\theta = p$,then find the value of $\sec\theta - \tan\theta$

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3. If $\tan\theta + \cot\theta = 2$,then find the value of $\tan^2\theta + \cot^2\theta$

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4. If $a\cos\theta + b\sin\theta = 4$ and $a\sin\theta - b\cos\theta = 3$,then find the value of $a^2 + b^2$

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5. Find the value of $\sec^2\theta(1+\sin\theta)(1-\sin\theta)$

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6. If sinθ+sin^(2) θ=1, then prove that cos^(2)θ+cos^(4)θ =1

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7. If x=asec $\theta \cos \phi$, y= bsec $\theta \sin \phi$,then find the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2}$

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8. If $\sec \theta + \tan \theta = x$,then find the value of $\frac{x^2 - 1}{x^2 + 1}$

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Topic 2 Trigonometric Identities Short Answer Type Question

1. Show that ,$\cot \theta \times \cos \theta + \sin \theta = \cos ec\theta$

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2. Show that :$\tan\theta.\sin\theta+\cos\theta=\sec\theta$

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3. Show that:

(a) $\left(1-\sin^2\theta\right)\sec^2\theta=1$

(b) $\left(1+\tan^2\theta\right)\cos^2\theta=1$

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4. Show that:

(a) $\left(1+\tan^2\theta\right)(1-\sin\theta)(1+\sin\theta)=1$

(b) $\frac{\sin\theta}{1+\cos\theta}+\frac{1+\cos\theta}{\sin\theta}=2\cos ec\theta$

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5. Prove that :

(a)$(\sin\theta+\cos\theta)^2=1+2\sin\theta\cos\theta$

(b)Sin A cos A tan A+cos A sin A cot A=1

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

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7. Prove that:

$$-1+\frac{\sin A\sin(90^\circ-A)}{\cot(90^\circ-A)}=\sin^2 A$$

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Topic 2 Trigonometric Identities Long Answer Type Questions I

1. Prove that:

$$(\sin\theta + \cos ec\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$$

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2. Prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \cos ec\theta + \cot\theta$

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3. Prove that:

$$\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta} = 1 - 2\sec\theta.\tan\theta + 2\tan^2\theta$$

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4. Show that: $\frac{1-\tan^2\theta}{\cot^2\theta-1}=\tan^2\theta$

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5. Show that sec A(1-sinA)(secA+tanA)=1.

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6. Prove that

$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta}}+\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}=2\sec\theta=2\sec\theta$$

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7. Prove that:

(a) $\frac{1+\sin\theta}{1-\sin\theta} = (\sec\theta+\tan\theta)^2$

(b) $\frac{\cos A}{1-\tan A} + \frac{\sin A}{1-\cot A} = \sin A + \cos A.$

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

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9. If $7\sin^2\theta + 3\cos^2\theta = 4$ and θ is acute then show that $\cot\theta = \sqrt{3}$

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10. Prove that: $\frac{\sin\theta}{1+\cos\theta}+\frac{1+\cos\theta}{\sin\theta}=2\cos ec\theta$

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11. $\cos^4 A-\sin^4 A=2\cos^2 A-1$

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12. Prove that identify:

$$\frac{\cos ec^2\theta}{\cos ec\theta-1}-\frac{\cos ec^2\theta}{\cos ec\theta+1}=2\sec^2\theta$$

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13. Prove that :

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

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Topic 2 Trigonometric Identities Long Answer Type Questions Ii

1. If $\text{cosec}\theta + \cot\theta = p$,then prove that:

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

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2. If $a\cos\theta + b\sin\theta$=m and $a\sin\theta - b\cos\theta$=n, prove that $m^2 + n^2 = a^2 + b^2$

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3. Prove that:

$$\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \tan\theta + \cot\theta$$

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Textbook Corner Exercise 11 1

1. In ΔABC, right-angled at B,AB=24cm,BC=7cm.

Determine :

(i)sin A,cosA

(ii)sin C,cos C

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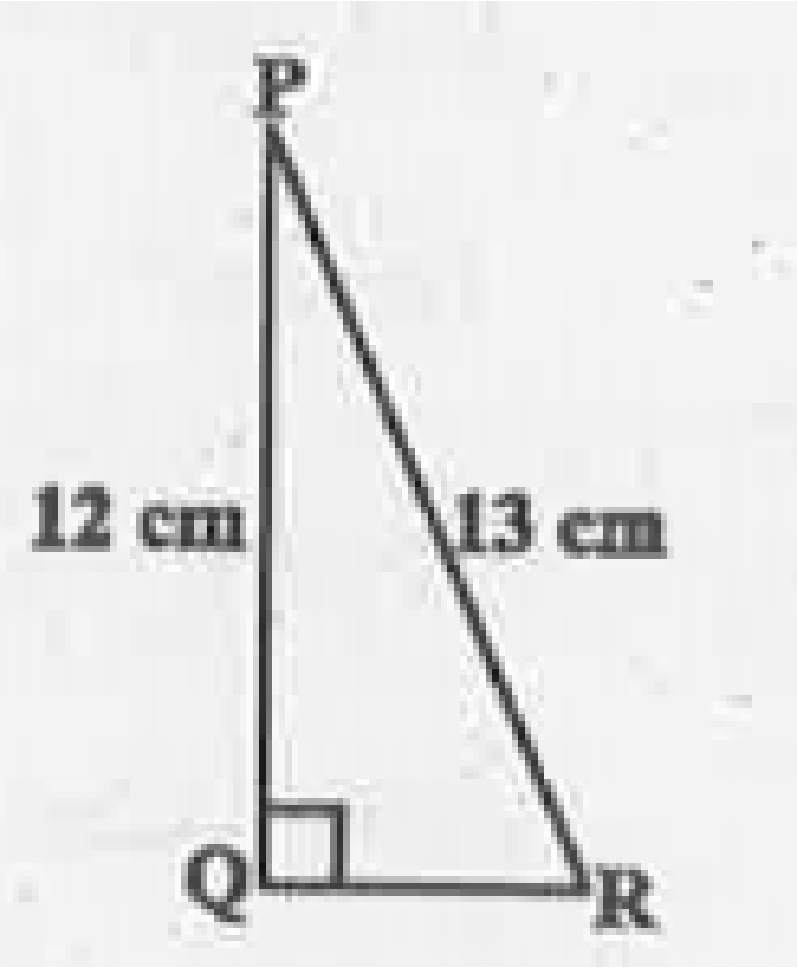
2. In fig. find $\tan P - \cot R$.



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

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4. Given 15 cot A=8 ,find sin A sec A.

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

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6. If $\angle A$ and $\angle B$ are acute angles such that $\cos A = \cos B$, then show that $\angle A = \angle B$.

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7. If $\cot\theta = \frac{7}{8}$,evaluate:

(i) $\frac{(1+\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}$

(ii)$\cot^2\theta$

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8. 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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Textbook Corner Exercise 11 2

1. Choose the correct option.Justify your choice

(i)$9\sec^2 A - 9\tan^2 A$

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. Choose the correct option.Justify your choice

(secA+tanA)(1-sin A)`

A. 0

B. 1

C. 2

D. `cos A

Answer: D

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4. $\frac{1+\tan^2 A}{1+\cot^2 A} =$

A. sec2A

B. -1

C. cot2A

D. $\tan^2 A$

Answer: A::B

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

(i) $(\cos ec\theta - \cot\theta)^2 = \dfrac{1-\cos\theta}{1+\cos\theta}$

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

(ii) $\dfrac{\cos A}{1+\sin A} + \dfrac{1+\sin A}{\cos A} = 2\sec A$

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

(iii) $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta\cos ec\theta$

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

(iv) $\frac{1+\sec A}{\sec A}=\frac{\sin^2 A}{1-\cos A}$

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

(v) $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \cos ecA + \cot A.$

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

(vi) $\sqrt{\frac{1 + \sin A}{1 - \sin A}} = \sec A + \tan A$

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

(vi) $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$

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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.

(cosec A-sinA)(secA-cosA)=$\frac{1}{\tan A + \cot A}$

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

$$\left(\frac{1+\tan^2 A}{1+\cot^2 A}\right) = \left(\frac{1-\tan A}{1-\cot A}\right)^2 = \tan^2 A$$

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