



Dr. V.S.E.C., Kidwai Nagar, Kanpur
Class- 9th
Revision Sheet-3
(Trigonometrical Ratios)

1. Show that: $\tan 7^\circ \tan 27^\circ \tan 63^\circ \tan 83^\circ = 1$.
2. If $\tan A = 0.25$ and $A + B = 90^\circ$, find the value of $\cot B$.
3. If $\tan 2A = \cot(A - 18^\circ)$, where $\angle A < 90^\circ$; find the value of A .
4. Prove that: $\frac{\tan A}{\tan(90^\circ - A)} + \frac{\sin A(90^\circ - A)}{\cos A} = \sec^2 A$.
5. In $\triangle ABC$, prove that: (i) $\tan \frac{B+C}{2} = \cot \frac{A}{2}$ (ii) $\cos \frac{B+C}{2} = \sin \frac{A}{2}$
6. Express each of the following in t-ratios of angles between 0° and 45° :
(i) $\cot 85^\circ + \sin 65^\circ$ (ii) $\sec 46^\circ - \cot 87^\circ$.
7. If $\sec \theta + \tan \theta = p$, show that: $\frac{p^2 - 1}{p^2 + 1} = \sin \theta$.
8. If $\sin^2 \theta + \sin \theta = 1$, prove that $\cos^4 \theta + \cos^2 \theta = 1$.
9. If $a \sin \theta + b \cos \theta = x$ and $b \sin \theta - a \cos \theta = y$, eliminate θ .
10. Solve for x (where $0^\circ < x < 90^\circ$) :
(i) $2 \cos 2x = \sqrt{3}$ (ii) $\tan 5x = 1$ (iii) $\frac{\cos x}{1 - \sin x} + \frac{\cos x}{1 + \sin x} = 4$ (iv) $2 \sin^2 x = 3 \cos x$.
11. Prove that: $\sqrt{\sec^2 A + \operatorname{cosec}^2 A} = \tan A + \cot A$
12. Prove that: $2(\sin^6 A + \cos^6 A) - 3(\sin^4 A + \cos^4 A) + 1 = 0$
13. If $\sin \theta = \cos \theta$, find the value of θ . Where θ is an acute angle. Hence find the value of $2 \tan^2 \theta + \sin^2 \theta - 1$.
14. Find the value of: $\sin^2 15^\circ + \sin^2 75^\circ - \tan^2 30^\circ$.
15. Evaluate: $4 \sin^2 30^\circ + \operatorname{cosec} 45^\circ \cos 45^\circ + 2 \tan 60^\circ \cos 30^\circ + \cos 0^\circ + \cot^5 45^\circ$.
16. In $\triangle ABC$, $\angle A + \angle B = 90^\circ$ and $\tan A = \frac{1}{3}$. Find $\sin A \cdot \cos B + \tan B$.
17. Without using trigonometric tables, find the value of:
 $\sin 55^\circ \sec 35^\circ + \cos 65^\circ \operatorname{cosec} 25^\circ + \sin^2 18^\circ + \sin^2 72^\circ$
18. Find the value of $\frac{5 \sin^2 30^\circ + \cos^2 45^\circ - 4 \tan^2 30^\circ}{2 \sin 30^\circ \cdot \cos 0^\circ + \tan 45^\circ}$
19. Evaluate: $\sin 30^\circ + \sin(33^\circ + \theta) - \cos(57^\circ - \theta)$.
20. If $\sin A = \frac{3}{5}$, find the value of $\frac{\sin^2 A + \tan^2 A}{\sin^2 A - \tan^2 A}$.



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Revision Sheet-4
(Expansion and Irrational numbers)

1. If $x = 1$, $y = -5$ and $z = -3$, find the value of $\frac{x^3 + y^3 + z^3 - 3xyz}{xy + yz + zx - (x^2 + y^2 + z^2)}$
2. $x + y = 8$ and $xy = 15$, $x > y$, find the value of $x - y$
3. If $2x - y + 3z = 0$, find the value of $4x^2 - y^2 + 9z^2 + 12xz + 2$
4. If $x + y + z = 6$, $xy + yz + zx = 11$, find the value of : $x^2 + y^2 + z^2 + 5$
5. If $4x^2 + \frac{1}{9x^2} = \frac{16}{3}$, find the value of $2x - \frac{1}{3x}$.
6. If $a + b = 15$ and $ab = 56$, $a > b$, find the value of $a - b$
7. If $x^2 + \frac{1}{25x^2} = \frac{43}{5}$, find the value of $x^2 - \frac{1}{25x^2}$
8. If $\frac{3+2\sqrt{2}}{3-\sqrt{2}} = a + b\sqrt{2}$, find the value of $a + b$
9. If $\frac{1}{9+4\sqrt{5}} = a - \sqrt{5}b$, find the value $a + 2b$
10. Simplify: $\frac{5+2\sqrt{6}}{5-2\sqrt{6}} + \frac{5-2\sqrt{6}}{5+2\sqrt{6}}$
11. If $\frac{3}{\sqrt{3}+1} + \frac{5}{\sqrt{3}-1} = a + b\sqrt{3}$, find the values of rational numbers a and b
12. If $x = 3 + 2\sqrt{2}$, find the value of $x^2 + \frac{1}{x^2}$
13. If $x - \frac{2}{x} = 3$, find the value of $x^3 - \frac{8}{x^3}$
14. If $a^2 - 5a - 3 = 0$, find the value of $a^3 - \frac{27}{a^3}$, where $a \neq 0$.
15. Simplify: $\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}}$



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Revision Sheet-5

(Factorisation)

1. Factorise: $18a^2 - 2(a^2 - 4)^2$
2. Factorise: $2(xy + zw) - x^2 + z^2 + w^2 - y^2$
3. Factorise: $p^4 + 64$
4. Factorise: $6a^6 + 156a^3 - 162$.
5. Factorise: $128x^5 - \frac{2}{x}$
6. Factorise: $x^2 + 11(x+1) + 7$
7. Factorise: $64a^7b - 729ab^7$
8. Factorise: $(x+1)^2 + x - 5$.
9. Factorise: $x^3 - 3x - 1 + \frac{3}{x} - \frac{1}{x^3}$
10. Factorise: $(1-x)^3 + (y-1)^3 + (x-y)^3$.
11. Factorise: $2x^8y^2 - 126x^5y^2 - 128x^2y^2$
12. Factorise: $(a-b)^3 + (b-c)^3 + (c-a)^3$.
13. Factorise: $1 + a + b + c + ab + bc + ca + abc$
14. Factorise: $(x-4)^2 - 9x$
15. Factorise: $m^3 + 3m^2n + 3mn^2 + 28n^3$
16. Factorise: $x^3 - y^3 + 4(x-y)$.
17. Factorise: $10x^2 - 29x - 21$.
18. Factorise: $a^4 - 11a^2 + 10$.
19. Factorise: $(x-4)^2 - 9(x-4) - 90$.
20. Factorise: $a^3 - 3a^2b + 3ab^2 - 2b^3$
21. Factorise: $(x^2 - x)(4x^2 - 4x - 5) - 6$
22. Factorise: $(2x - y)^2 - 11(2x - y) + 28$
23. Factorise: $a^4 - 20a^2 + 4$
24. Factorise: $x^3 - 3 + x - 3x^2$
25. Factorise: $3x^4 - 210x^2 + 867$
26. Factorise: $5x^6 + 315x^3 - 320$
27. Factorise: $(14x^2 + 35x)(2x^2 + 5x - 19) + 588$
28. Factorise: $a^6 - 7a^3 - 8$
29. Factorise: $x^9 - 1$
30. Factorise: $2\sqrt{2}a^3 + 3\sqrt{3}b^3 + \sqrt{5}(5 - 3\sqrt{6}ab)$