

ADHIKAANSH

ACADEMY

(IITJEE NEET IX X XI XII)

RUN BY:

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Ex. Faculty of

Resonance Kota, Career Point Kota

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MATHS NOTES

(CLASS 11TH)



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*So why
to wait...*



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Chapter 3: Trigonometric functions

Concept:

Radian measure- relation between degree and radian- trigonometric functions- sign of trigonometric functions- trigonometric functions of sum and difference of two angles- trigonometric equations- sine formula- cosine formula- their applications.

Notes:

- If in a circle of radius r , an arc of length ' l ' subtends an angle of θ radians then $l = r\theta$.
- Radian measure $= (\pi/180) \times$ degree measure.
- $\sin(-x) = -\sin x$
- $\cos(-x) = \cos x$
- $\cos(2n\pi+x) = \cos x$
- $\sin(2n\pi+x) = \sin x$
- $\sin x = 0$ gives $x = n\pi$ where $n \in \mathbf{Z}$
- $\cos x = 0$ gives $x = (2n+1)\pi/2$ where $n \in \mathbf{Z}$
- Refer text book for other formulas.

Text book questions

Ex:3.1

Questions: 1*, 2*, 3*, 6

Ex:3.2

Questions: 6, 7, 8, 9, 10

Ex:3.3

Questions: 5, 6, 7*, 11, 12*, 14*, 15*, 16,

18, 21*,

22**, 23**, 24*, 25*

Ex:3.4

Questions: 5, 6, 7, 8, 9**

Misc. Ex:

Questions: 2, 3, 5, 6, 7, 8*, 9*, 10*

Examples:

Questions: 24**, 25**, 26*, 27*, 29**

Supplementary text

Ex:3.5
14**, 15**, 16**

Questions: 1, 3, 6, 7, 10, 11, 13,

Examples:

Questions: 27**, 28*

Extra/ HOT Questions

1. The angles of a triangle are in A.P and the greatest angle is double the least. Express the angles in degrees and radians
2. Show that the equation $\operatorname{cosec} x = 4ab/(a+b)^2$ ($ab > 0$) is possible if $a=b$
3. Show that a) $\sin 150 \cos 120 + \cos 330 \sin 660 = -1$

$$\text{b) } \frac{\cos(90+x) \sec(-x) \tan(180-x)}{\sec(360-x) \sin(180+x) \cot(90=x)} = 1$$

4. If $\tan x = \frac{m}{m+1}$ and $\tan y = \frac{1}{2m+1}$, show that $x+y = 45^\circ$

5. Show that the following:

a) $\cos 10 \cos 50 \cos 60 \cos 70 = 3/16$

b) $\sin 10 \sin 50 \sin 60 \sin 70 = \sqrt{3}/16$

c) $\cos 20 \cos 40 \cos 60 = 1/8$

6. If $\sin x \sin y = 1/4$ and $3 \tan x = 4 \tan y$ then prove that $\sin(x+y) = 7/16$

7. Prove that $\frac{\sin 11x \sin x + \sin 7x \sin 3x}{\cos 11x \sin x + \cos 7x \sin 3x} = \tan 8x$

8. If $m \tan(x-30) = n \tan(x+120)$ then show that $\frac{m-n}{2(m+n)} = \frac{1}{4} \sec 2x$

9. Solve the equation $4 \sin x \cos x + 2 \sin x + 2 \cos x + 1 = 0$

10. Solve the triangle when $c=3.4\text{cm}$, $A=25^\circ$, $B=85^\circ$
[ans; $a=1.53\text{cm}$, $b=3.6\text{cm}$, $C=80^\circ$]

11. Show that for any parallelogram, if a and b are the sides of two non parallel sides, x is the angle between these two sides and d is the length of the diagonal that has a common vertex with sides a and b , then $d^2 = a^2 + b^2 + 2ab \cos x$

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