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 = rθ.
- Radian measure =(π/180) x degree measure.
- Sin (-x) = - sin x
- Cos (-x) = cos x
- Cos(2nπ+x) = cos x
- Sin (2nπ+x) = sin x
- Sin x = 0 gives x = nπ where n ϵ **Z**
- Cos x = 0 gives x = (2n+1)π/2 where n ϵ **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 Questions: 1, 3, 6, 7, 10, 11, 13, 14^{**}, 15^{**},16^{**}

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 cosec x=4ab/(a+ b)^2 (ab>0) is possible if a=b
3. Show that a) sin 150 cos120 + cos330 sin 660 = -1

   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 = 45^0
5. Show that the following:

   a) cos 10 cos 50 cos60 cos70=3/16

   b) sin 10 sin 50 sin60 sin70=$\sqrt{3}/16$

   c) cos 20 cos40cos60=1/8
6. If sin x sin y =1/4 and 3tanx=4tany then prove that sin(x+y)=7/16
7. Prove that $\frac{\sin 11x\ sinx+sin7x\ sin3x}{cos11x\ sinx+cos7x\ sin3x} = tan8x$
8. If m tan(x-30)= n tan(x+120) then show that $\frac{m-n}{2(m+n)} = \frac{1}{4}sec2x$
9. Solve the equation 4 sinx cosx + 2sinx +2cosx+1=0
10. Solve the triangle when c=3.4cm ,A=25^0,B=85^0
    [ans; a=1.53cm,b=3.6cm,C=80^0
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 $d^2= a^2+b^2+2ab \cos x$