LEARNING MATERIAL ON TRIGONOMETRY

SEMESTER : I

DEPARTMENT: MATHEMATICS AND SCIENCE SUBJECT NAME: ENGINEERING MATHEMATICS-I

SUBJECT CODE: TH.3

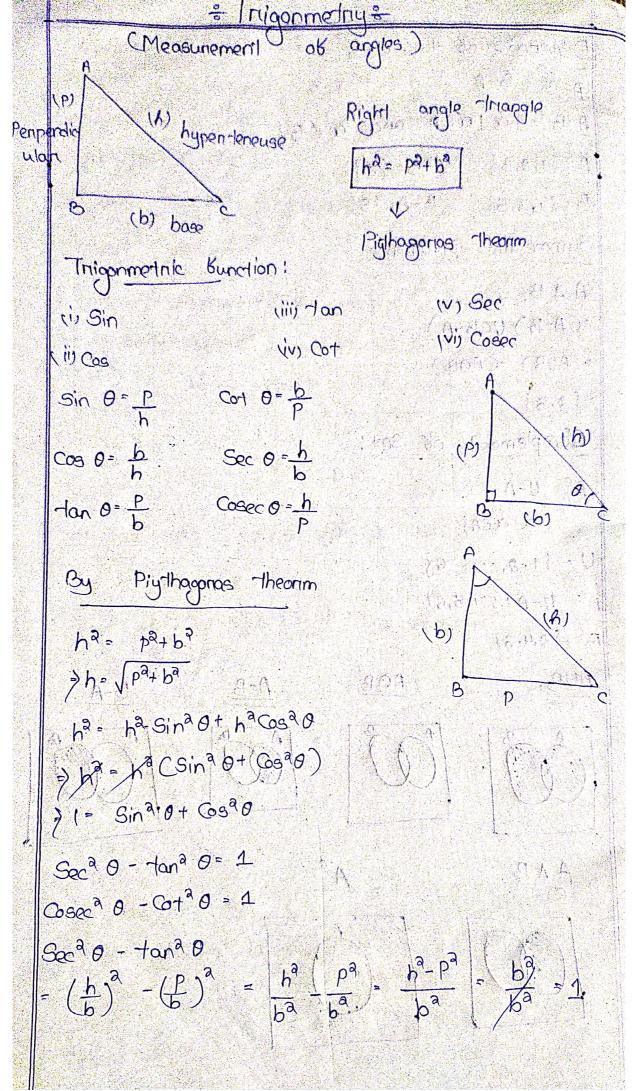
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$$\begin{array}{c} \cos^2\theta - \operatorname{Gd}^a\theta \\ = \left(\frac{h}{h}\right)^2 - \left(\frac{h}{h}\right)^3 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot \frac{h^2}{p^2} \cdot 1 \\ \cdot \frac{h^2}{p^2} - \frac{h^2}{p^2} \cdot \frac{h^2}{p^2}$$

			No. 10 May Department of Control		The last of the second		Astan Salar	
	Cot 0= (Coseca 0-1							
	$=\int (x)^3-1=\int (y-1)=\sqrt{3}$							
6	$\pi = 3.14$ $\pi = 180^{\circ} + \frac{\pi}{6} = 30^{\circ}$							
	HENGTON : : : : : : : : : : : : : : : : : : :							
	= <u>88</u> 7			W.	⁻= 360°			
	= V10	<u>-\}</u>	- = 60°	$\frac{\lambda}{a}$	45°			
	0					Co°	1//	
	Sino	0	30 1/a	45°	<i>60</i> ° ∫ √3/2	90°		
	Ges 0		13/2	1/va	1/2	1, 0		
	fan 0	0 (4)	1/13	d'ac	• V 3-	· Ø		
	Co+0	00	√ 3		上る	O		
	Sec 0		8/13	Vā	ని	ග		
	G800 O	<i>0</i> >	, a	Va	9/13	4. 1		
S	in C 90°-0) = Cos O	307	G.A	00000		-	
					(90°+0)=			
	(Cos (200-0) = Sin 0 (Cos (200+0) = -Sin 0 tan (200+0) = -Cot 0							
			Shirt	Cod	Care	- CO1 E	•	
G	H (90°-0)	= tan 0		G22		-tan 0		
06	°C90°-0)	= Casec 0			(90+0)=	- Coerc 0	To he #	
9	escodg-0)=Sec 0	<u>- 1</u>	060	C90+0)= Sec 8		
				908				
				< 0	< 9< 90			
			EV. A					
ànd €			191	131 0				
180° ==				360°				
, 3nd 0			44h	41h 0				
	 ইাওঁ							
E STATE						oonnad wit	h ComCoor	614

Sin (1800_0) = Sin 0 (888)	Sin C188+0)=-Sin 0		
GS C180°-07=-030	Cos (188+0) Co+ 0		
-lan (1809-10) = (-1an 0	-lan (180°+0) =-lan 0		
Con (188-0) = - Con 0	CO-1 C188+0)-CO-1 O		
Spc C180 - 0) = -Spc 0	Sec (1884 9) = Sec 0		
Coser (180°-0) = Coser 0	Cosoc (188+6) = -(0300 0		
Sin (278-0) Cos 0	9 in (878+8) = - Cos 0		
05 (278-0) = - Sin 0	Cos (270+0)= 5in0		
tan (270°-0)= (0+ 0	-lan (270+0)=-Co-10		
0+ (270°-0)= tan 0	(0+ (270+0) = -ton 0		
Sec (278-0) = - Garc 0	Sec (270+0) = Cosa 0		
Gosec (270°-0): - Sec 0 (8	Cosec (a18+0)= -Sec. 8		
Sin (-0) = -Sin 0	86. 00		
Cos (-0) = Cos 0 3000)			
400ml Charlet : 남아() 2.0 보에 되어 보여 12 12 12 12 12 12 12 12 12 12 12 12 12	A contains to the contains A		
G+ C-0) = -CO16	NEO-BEDINAR CEMEN		
Sec (-0) = Sec 0	2 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 -		
(Coepc (-0) = - (0) ec 0	CAMB-AZONAZO) - (BIAD ZÓ)		
() () () () () () () () () ()	inie : a 20 A 20 - (6-1) 20		
a < b 16 0-b <0 on	C-ve)		
a>b ik a-b >o on	C+ve)		
Sin (1792) = Sin (360°	(cob = abc) = (d-aba)		
Sin (-8)	anotanotanota a Contras		
= -Sin 8	grantanist		
	3+54) WHA 100 (0-9) HO		
= -Sin 54°	A WAS OF		
	그리고 그렇게 되었다고 있었다면 하고 있는데 그리고 있다.		

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Sin (-3888) = 3in (360° ×10 +288)
                       the former of their
  = -Sin a88°
      sin (360°-72°) = Sin 72° = Sin (90°-180)
        = Cos 18°
tan (7865) = tan (360 x 20 + 65)
        · Jan 63°
        = dan (90°- 25°)
   = Co+ 25°
 Cos (5397°) = Cos (360 × 14+ 357)
         = 69 357
      = Cos C360°-3)
  C 720 - C C 3
Sec (1938) = Sec (360 x 5 + 138)
       : Spc 138:
         = Sec (90+48) = - Casec 48°
Sin (A+B) = Sin A. Cos B+ Cos A. Sin B
Sin CA-B) = Sin A. Cos B - Cos A. Sin B
Cos CA+B) = Cos A·Cos B-Sin A·Sin Be ( 500)
Cos CA-B) = Cos A. Cos B+ Sin A. Sin B
                  v-Ding-ox d-h & d > 0
Tan (A+B) = tan A+tan B

1-tan A·tan B (Cot (A-B) = Cot A: Cot B
                  19 (04 (H-B) = (04 H) (04 B+1)
                                CO1B-RO1A
tan(A-B) = tan A-tan B (8-) (8-)
          1+ Jan A-Jan B 8 no
Cot CA+B) = Cot A: Cot B-1
          CO1 B7 GO1 A
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Sin 75° = Sin (45° + 30°)

= Sin 45° +
$$\frac{1}{\sqrt{5}}$$
 + $\frac{1}{\sqrt{5}}$ + $\frac{1}{\sqrt{5}}$

= $\frac{1}{\sqrt{5}}$ + $\frac{1}{\sqrt{5}}$ + $\frac{1}{\sqrt{5}}$ + $\frac{1}{\sqrt{5}}$

= $\frac{1}{\sqrt{5}}$ + $\frac{1}{\sqrt{5}}$ + $\frac{1}{\sqrt{5}}$

Sin 15° = Sin (45° - 30°)

= Sin 45° + $\frac{1}{\sqrt{5}}$ + $\frac{1}{\sqrt{5}}$

	to the state of th	and the second section is a second to the second	
	Cog an = a cog?n = 1	Cos &p on	1-2SinaA
) 1+ Cos 2A = 2 Cos? A"	/ 1-Cog an =	a sina A
) 1+ COS 2A = 2 COS A	> 1- Cos a A	&Sin°A
		2	*
Alexander and the second) 1+ Cos 2 A = Cos 7 A) 1-Cosan	. SinaA
	X	Q	
	tan = 1-002A	TRY SHOT IS	
	l+ Gaan	- he , j Suide	
	가 (CAN) 가지 않는 [Fig. 18 - 18 - 18 - 18 - 18 - 18 - 18 - 18	RV EV 7	
	1 2		
	Cos A = 1+ Cos 2A	81/2 + 5 ⁴ / ₂ 31/3	
	√ 2	1-81	
	tan A = \[\frac{1-cos2A}{1+cos2A} \]	6V8	
	J Itas aA	CAHADAT	AP AP
		DFA 200 A aice	
	Put 0 = A	A 200 A ME & I =	
	$3in A = Sin \frac{\theta}{a} = \sqrt{\frac{11\pi c \cdot 1066}{a}}$	A S	
	$\frac{1}{4} \frac{1}{1} \frac{1}{1} \frac{1}{2} \frac{1}$	1-002A	100 40
	$4500 + 1 = \frac{\sin^2 \theta}{4} = \frac{1}{1}$	<u> </u>	
	² a Sin²0 = L		A (ship)
		(C as
∥ Sì	$n\frac{\theta}{2} = \sqrt{\frac{1-690}{3}}$	$\tan \theta = \int \frac{1-\cos \theta}{1+\cos \theta}$	50
H_{\bullet}	1 202 th	12 V 1+ Ge	3 0
60	$\frac{\theta}{2} = \sqrt{\frac{1+\cos\theta}{2}}$		

$$(Cos A + Sin A)^{2} = Cos^{2} A + Sin^{2} A + 2 : Cos A : Sin A$$

$$= I + Sin 2A$$

$$(Cos A - Sin A)^{2} = Cos^{2} A + Sin^{2} A - 2 Cos A : Sin A$$

$$= Asin I - Sin 2A$$

$$\pm (Cos \frac{A}{2} + Sin \frac{A}{2}) = \sqrt{I - Sin 0}$$

$$\pm (Cos \frac{A}{2} + - Sin \frac{A}{2}) = \sqrt{I - Sin 0}$$

$$\pm (Cos \frac{A}{2} + - Sin \frac{A}{2}) = \sqrt{I - Sin 0}$$

$$\sqrt{I - Sin 0} = \pm Cos \frac{A}{2} + Sin \frac{A}{2}$$

$$\sqrt{I - Sin 0} = \pm Cos \frac{A}{2} + Sin \frac{A}{2}$$

$$Cos \frac{A}{2} + Sin \frac{A}{2}$$

$$= \sqrt{I + Sin 0} + Sin \frac{A}{2}$$

$$= \sqrt{I + Sin$$

tan
$$C_{4}^{T} + \theta$$
)

= $tan \frac{T}{4} + tan \theta$

[- $tan \frac{T}{4} + tan \theta$]

= $tan \frac{T}{4} + 4 + tan \theta$

= $tan \frac{T}{4} - tan \theta$

್ ನಿ Sinc Cos (A-B) - ನಿSinc Cos (A+B) Scanned with CamScanner

tan 10 + tan 35 + tan 10 · tan 35 = 1
Tan 45° = tan (35+10)
1 = clap 36 + clap 10°
I-rian 35° -rian 10°
) 1-1lan 35°lan 10° = -lan 35°+ -lan 10°
7 tan 10° + tan 35° + tan 10 + tan 35 = 1 (Proved)
A+B+C.1+1809121) (A.112.100)
A+B= 180-9 (180)
(09 CA+B) = (09 C180-C)
- Cog CA+B Cog C 0
A+B=188-C (00) 10 - 901011977X3
Sin(A+B) = Sin(180-c)
Sin (A+B- Sinc - 0
Cos (A+B) + Sinc = Sin(A+B) - Cos (CProved)
A+B+C = 180°
7 B+C = 180°-A
$\frac{1}{3} \frac{B+C}{a} = \frac{186-A}{a} = 96-\frac{A}{a}$
) tan B+C = Cot A C Proved)
A+B+C=180° Depart tinzono de la coloridad de l
7 A+B=180°-C
1 tan (A+12) = tan (180-c)
itan Attan B = -tan c
) tan A+tan B
-tanA·tanB

```
Itan A+ lan B = -tanc - (-tanc) · tan A. lon B
    HanA+tanB+tanc= lanA-tanB-tanc (Moved)
     Sec an-tanan
      Cos 2A - lan 2A
                   TO THE SERVICE SOLUTION OF THE
    - 1 Sinan Cosan Cosan I con no min
    = \frac{1-\sin 2A}{\cos 2A} = \frac{(\cos A - \sin A)^2}{(\cos A - \sin A)} \frac{(\cos A - \sin A)^2}{(\cos A + \sin A)(\cos A - \sin A)}
                                      CPrioved)
    - CosA-SinA
        COSA + Sin A
                        Excencise - 4 Ca)
(1) (1) Cos 270° = +ve
                              on one of the
   (ii) Sec 73° = + ve
   (1V) COSEC 159° = +VR
   (V) Soc 199° = -VP
    (vi) Cosec 1260=+VP
   (VII) Cos 315° = + VP
   (vii) Cot 375° = + ve
                                      who see the most of
189 Gos 0 = a++ doesn't have a Solution it a $0
    Cos 0 / a+1
   (Os 0) = (a+ a)
          = (a - \frac{1}{a})^2 - 4 \cdot a \cdot \frac{1}{a} (2.630 act. - (2.43 act.)
           =(\alpha - \frac{1}{\alpha})^{2} + 4
```

Scanned with CamScanner

Sin 8+ Sin 8= a

$$\frac{\partial S}{\partial S} + \frac{\partial S}{\partial S} = b$$

Prove -that $\frac{1}{2} + \frac{\partial S}{\partial S} = \frac{\partial S}{\partial S}$

	Invense Trijophmetry Bunctions
	Sin a= 8
	Sinty on Sinter and
	Sin' (Sin a) a Sin' à = T
	(pg-1 (cos n) = n
	tan Ctan no = n
	Cose a = 1 = y
	1 x = Sin-1y) x = Cosec-14 ()
	Sin-1 y = Cosc-1 - 1
	tan'y= (01-1)
	(A A D + 4A A D) THE ARE OF SECTION AS A D ME
	Sina at + Coga a=1
) Sinα= √1- Cosaα (A6 202-A6 ni2-6) A6 100
	$Sin^{-1}\alpha = \cos\sqrt{1-\alpha^2} \qquad (A6\cos6) = (A6\cos6)$
	$\operatorname{Sin}^{1}\alpha = \operatorname{dan}^{1}\frac{\alpha}{\sqrt{1-\alpha^{2}}}$
	- 005 y = (1- Singy
	±√1-α² d'210> 0 € 30
	4= 2007 = 11-02 books (-(dos) 3 x6
	ainina Cosine
-	tan 1 (0-1 1 (2- 1)

Scanned with CamScanner

Sx at Cosx a =
$$\frac{\pi}{2}$$

to a + to a 'y = to a | $\frac{\pi}{1-\alpha y}$

to a + to a | $\frac{\pi}{1-\alpha y}$

to a + to a | $\frac{\pi}{1-\alpha z}$

to a | $\frac{\pi}{1+\alpha z}$