trigonometry

1)

If sinA = ¾, find the value of cosA.

$\sin A = \frac{3}{4}$

$\frac{P}{H} = \frac{3}{4}$

If $P = 3$ then $H = 4$

$4^2 = 3^2 + B^2$

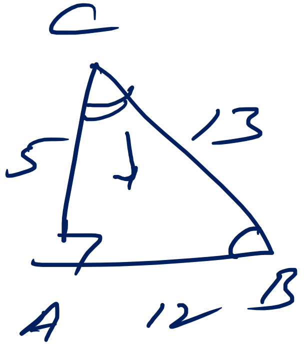
$\sqrt{7} = B$

$\cos A = \frac{B}{H}$

$= \frac{\sqrt{7}}{4}$ Ans

2)

in triangle ABC, right angled at A, AB = 12, BC = 13. find the value of tanB.sinC.



$$\tan \underline{\underline{B}} = \frac{P}{B} = \frac{5}{12}$$

$$\sin \underline{C} = \frac{P}{H} = \frac{12}{13}$$

$$\tan B \cdot \sin C = \frac{5}{\cancel{12}} \times \frac{\cancel{12}}{13}$$

$$= \frac{5}{13}$$

3)

If 3.sinA – 4.cosA = 0, find the value of tanA.

$$3 \sin A = 4 \cos A$$

$$\frac{\sin A}{\cos A} = \frac{4}{3}$$

$$\tan A = \frac{4}{3}$$

4)

If 8.sinA – 2.cosA = 3.sinA + 8.cosA, find the numerical value of sinA.

$8\sin A - 3\sin A = 8\cos A + 2\cos A$

$\cancel{5}\sin A = \cancel{10}^{2}\cos A$

$\frac{\sin A}{\cos A} = 2$

$\tan A = \frac{2}{1}$

$\frac{P}{B} = \frac{2}{1}$

If $P = 2$, $B = 1$

$H = \sqrt{5}$

$\sin A = \frac{P}{H} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

5) $\frac{\sin 15^\circ}{\cos 75^\circ} = \frac{\sin 15}{\sin(90-75)} = \frac{\sin 15}{\sin 15} = 1$

$\sin 10^\circ = \cos 80^\circ$

$\sin 20 = \cos 70$

$\tan 30^\circ = \cot 60^\circ$

$\operatorname{cosec} 70^\circ = \sec 20^\circ$

$\frac{\cancel{\sin 15}}{\cancel{\cos 75}} = 1$

$\cancel{\sin 15} - \cancel{\cos 75}$

0

6) $2\sin^2 60^\circ + \cos^2 30^\circ + 2\sin^2 90^\circ + 3\cos^2 0^\circ - \tan^2 60^\circ =$

$$2\left(\frac{\sqrt{3}}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 + 2(1)^2 + 3(1)^2 - (\sqrt{3})^2$$

$$\cancel{2}\cdot\frac{3}{\cancel{4}\,2} + \frac{3}{4} + 2 \cancel{+ 3 - 3}$$

$$\frac{3}{2} + \frac{3}{4} + 2$$

$$\frac{6+3+8}{4} = \frac{17}{4}$$

7) If $\tan\theta = \cot(60^\circ + \theta)$, then $\theta =$

$\cot(90-\theta) = \cot(60+\theta)$

$90-\theta = 60+\theta$

$30 = 2\theta$

$15^\circ = \theta$

8) If $\cot\theta = \frac{7}{8}$, then $\frac{(1-\sin\theta)(1+\sin\theta)}{(1+\cos\theta)(1-\cos\theta)} = \frac{1-\sin^2\theta}{1-\cos^2\theta}$

$= \frac{\cos^2\theta}{\sin^2\theta}$

$= \cot^2\theta$

$= \left(\frac{7}{8}\right)^2$

$= \frac{49}{64}$

$\sin^2\theta + \cos^2\theta = 1$

$\sec^2\theta - \tan^2\theta = 1$

$\operatorname{cosec}^2\theta - \cot^2\theta = 1$

$\tan\theta = \frac{\sin\theta}{\cos\theta}$

$\cot\theta = \frac{\cos\theta}{\sin\theta}$

9) $\cos^2 73^\circ - \sin^2 17^\circ =$ 0

$\cos^2 73^\circ - \cos^2 (90 - 17)$

$\cos^2 73^\circ - \cos^2 73$

0

10) $\dfrac{\cos 75^\circ}{\sin 15^\circ} + \dfrac{\sin 75^\circ}{\cos 15^\circ} + \dfrac{\cos 31^\circ}{\sin 59^\circ} + \dfrac{\sin 31^\circ}{\cos 59^\circ} =$

$1 + 1 + 1 + 1$

$\underline{4}$

11) $\sin^{2015} 0^\circ + \sin^{2015} 90^\circ =$

$(0)^{2015} + (1)^{2015}$

$0 + 1$

1

12) If $\sin\theta = \frac{2015}{2016}$, find the value of $\sec^2\theta - \tan^2\theta$.

/

13) tan(45° – A/2) is equal to (for A = 30°)

$$\tan\left(45 - \frac{30}{2}\right)$$

$$\tan(45 - 15)$$

$$\tan 30$$

$$\frac{1}{\sqrt{3}}$$

14) The compliment of 89.5° is

$90 - 89.5$

$0.5°$

15) Find the values of A and B if $\sin(4A-2B)=\frac{\sqrt{3}}{2}$, $\sec(3A-2B)=\frac{2}{\sqrt{3}}$ **(3 marks)**

$\sin(4A-2B)=\sin 60^\circ$

$4A-2B=60^\circ$ —— ①

$\sec(3A-2B)=\sec 30^\circ$

$3A-2B=30^\circ$ —— ②

$-\quad +\quad -$

① − ②

$\boxed{A=30^\circ}$

$3(30)-2B=30^\circ$

$\boxed{B=30^\circ}$

16) In any triangle ABC, prove: $\tan\left(\frac{A+C}{2}\right)=\cot\left(\frac{B}{2}\right)$ **(3 marks)**

$A+B+C=180$

$A+C=180-B$

$\frac{A+C}{2}=\frac{180-B}{2}$

$\frac{A+C}{2}=\frac{180}{2}-\frac{B}{2}$

$\frac{A+C}{2}=90-\frac{B}{2}$

taking ~~staking~~ tan,

$\tan\left(\frac{A+C}{2}\right)=\tan\left(90-\frac{B}{2}\right)$

$\tan\left(\frac{A+C}{2}\right)=\cot\frac{B}{2}$