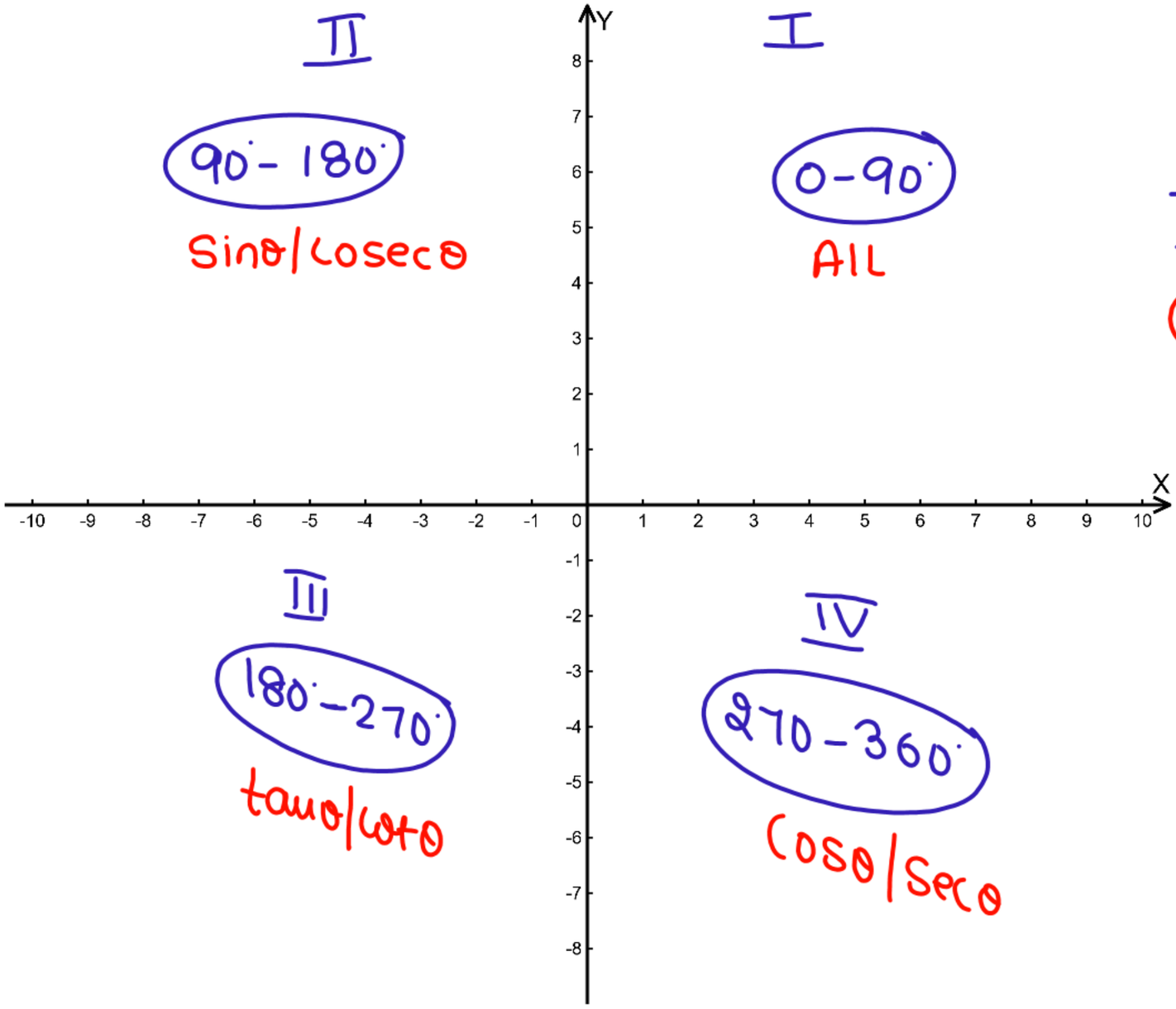
TRIGONOMETRY

SHEET 03

Basic Questions Based on Values of Trigonometric Ratio in Different Quadrants



Trick:-

Add sugar to Coffee.

Quadrants

Change
- $(90-\theta) \rightarrow$ I
- $(90+\theta) \rightarrow$ II

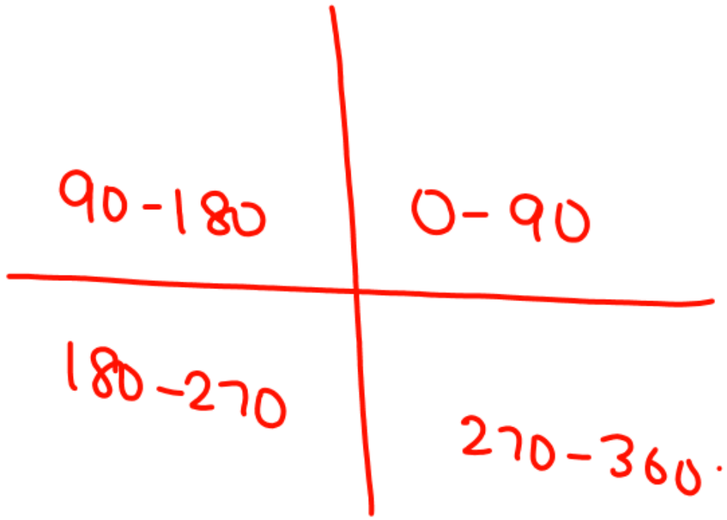
$(180-\theta) \rightarrow$ II

$(180+\theta) \rightarrow$ III

Change
- $(270-\theta) \rightarrow$ III
- $(270+\theta) \rightarrow$ IV

$(360-\theta) \rightarrow$ IV

$(360+\theta) \rightarrow$ I



Note:- 90° के odd multiple पर

$\sin\theta \rightleftharpoons \cos\theta$

$\operatorname{cosec}\theta \rightleftharpoons \sec\theta$

$\tan\theta \rightleftharpoons \cot\theta$

$90 \times 1 = 90^\circ$ ✓

$90 \times 2 = 180^\circ$ ✗

$90 \times 3 = 270^\circ$ ✓

1 → odd

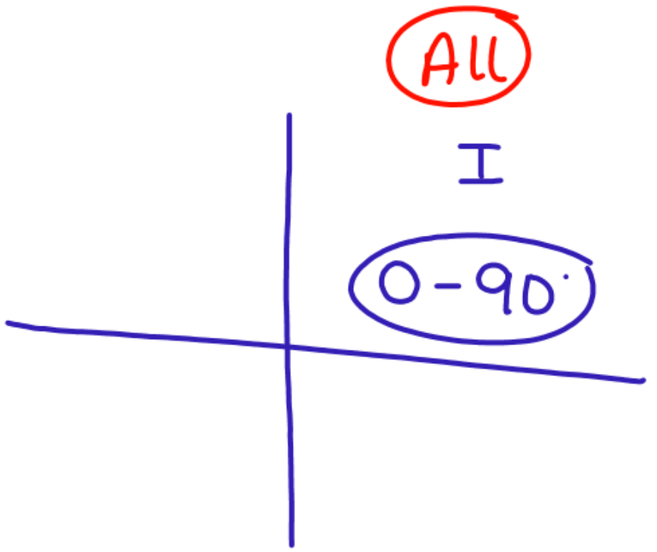
3 → odd

$(-\theta)$

* $\sin(-\theta) = -\sin\theta$
* $\cos(-\theta) = \cos\theta$
* $\tan(-\theta) = -\tan\theta$
* $\operatorname{cosec}(-\theta) = -\operatorname{cosec}\theta$
* $\sec(-\theta) = \sec\theta$
* $\cot(-\theta) = -\cot\theta$

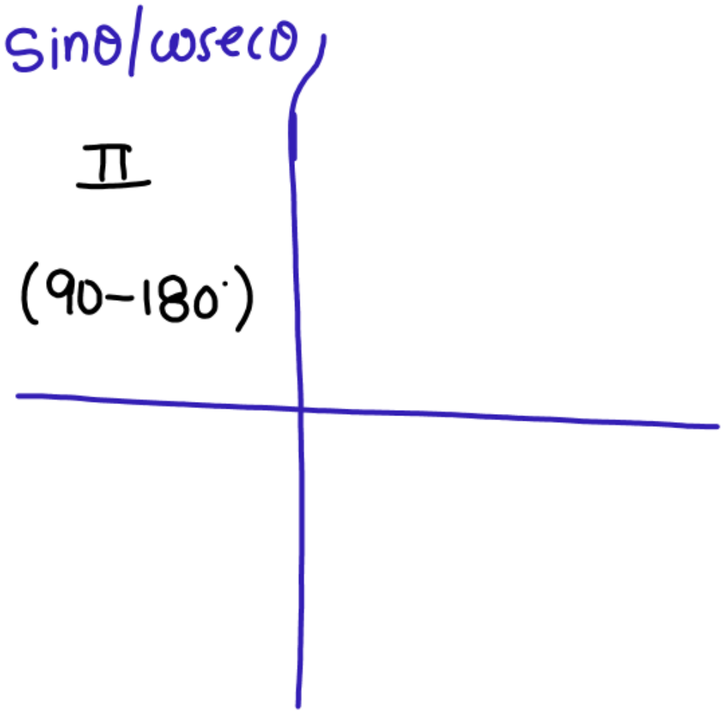
For $(90-\theta)$

* $\sin(90-\theta) = \cos\theta$
* $\cos(90-\theta) = \sin\theta$
* $\tan(90-\theta) = \cot\theta$
* $\operatorname{cosec}(90-\theta) = \sec\theta$
* $\sec(90-\theta) = \operatorname{cosec}\theta$
* $\cot(90-\theta) = \tan\theta$



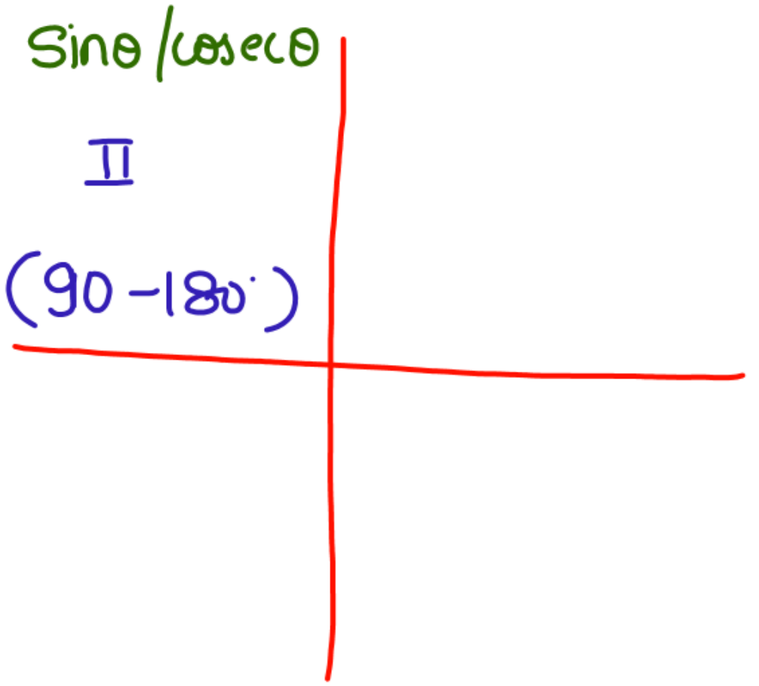
For $(90+\theta)$

* $\sin(90+\theta) = \cos\theta$
* $\cos(90+\theta) = -\sin\theta$
* $\tan(90+\theta) = -\cot\theta$
* $\operatorname{cosec}(90+\theta) = \sec\theta$
* $\sec(90+\theta) = -\operatorname{cosec}\theta$
* $\cot(90+\theta) = -\tan\theta$



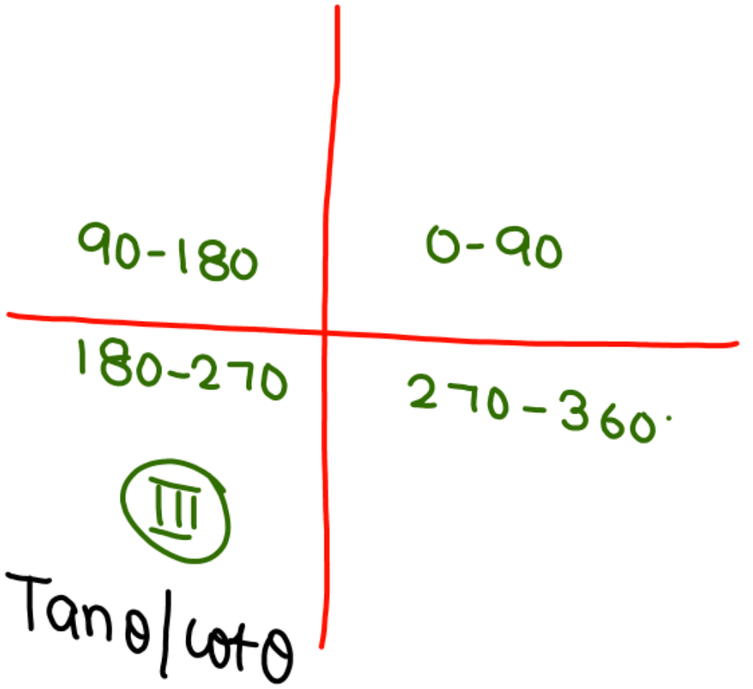
For (180 - θ)

* $\sin(180-\theta) = \sin\theta$
* $\cos(180-\theta) = -\cos\theta$
* $\tan(180-\theta) = -\tan\theta$
* $\operatorname{cosec}(180-\theta) = \operatorname{cosec}\theta$
* $\sec(180-\theta) = -\sec\theta$
* $\cot(180-\theta) = -\cot\theta$



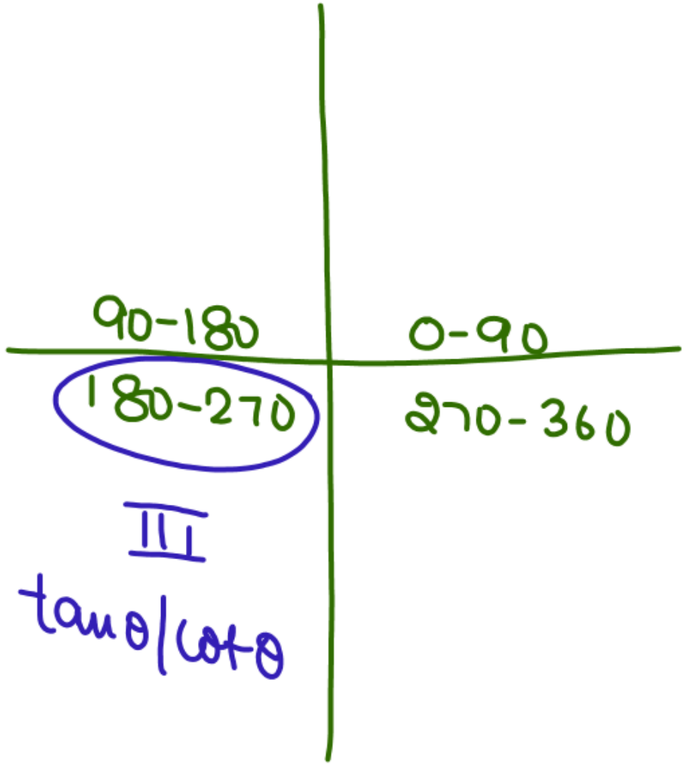
For $(180+\theta)$

* $\sin(180+\theta) = -\sin\theta$
* $\cos(180+\theta) = -\cos\theta$
* $\tan(180+\theta) = \tan\theta$
* $\operatorname{cosec}(180+\theta) = -\operatorname{cosec}\theta$
* $\sec(180+\theta) = -\sec\theta$
* $\cot(180+\theta) = \cot\theta$



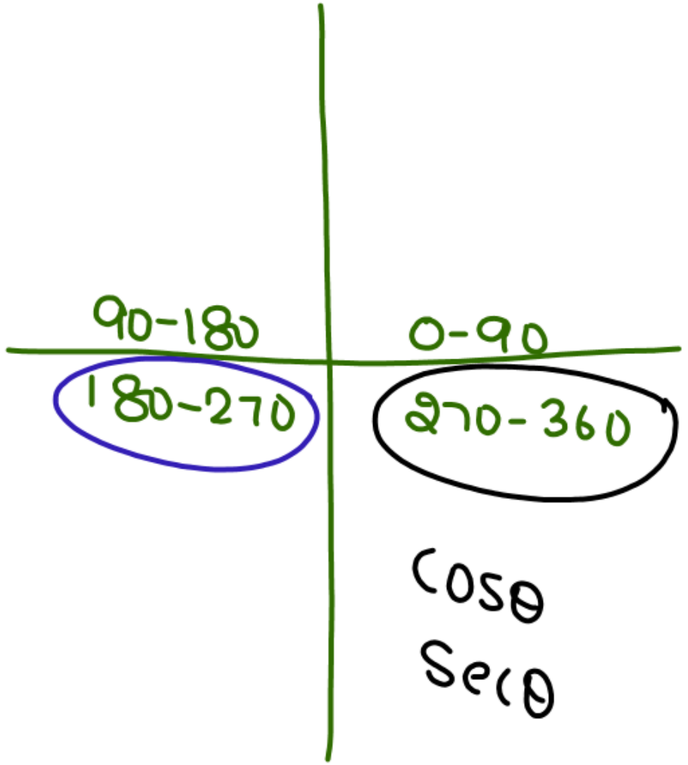
For (270 - θ)

* $\sin(270-\theta) = -\cos\theta$
* $\cos(270-\theta) = -\sin\theta$
* $\tan(270-\theta) = \cot\theta$
* $\operatorname{cosec}(270-\theta) = -\sec\theta$
* $\sec(270-\theta) = -\operatorname{cosec}\theta$
* $\cot(270-\theta) = \tan\theta$



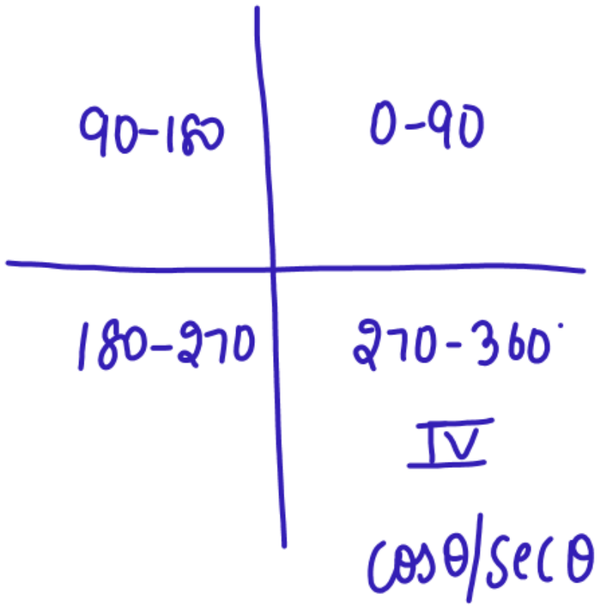
For $(270+\theta)$

* $\sin(270+\theta) = -\cos\theta$
* $\cos(270+\theta) = \sin\theta$
* $\tan(270+\theta) = -\cot\theta$
* $\operatorname{cosec}(270+\theta) = -\sec\theta$
* $\sec(270+\theta) = \operatorname{cosec}\theta$
* $\cot(270+\theta) = -\tan\theta$



For $(360-\theta)$

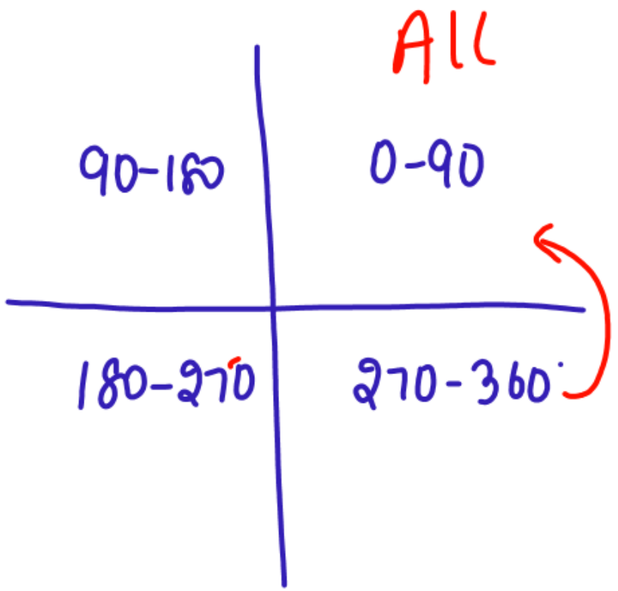
* $\sin(360-\theta) = -\sin\theta$
* $\cos(360-\theta) = \cos\theta$
* $\tan(360-\theta) = -\tan\theta$
* $\operatorname{cosec}(360-\theta) = -\operatorname{cosec}\theta$
* $\sec(360-\theta) = \sec\theta$
* $\cot(360-\theta) = -\cot\theta$



For $(360+\theta)$

$0 \leq 90$

* $\sin(360+\theta) = \sin\theta$
* $\cos(360+\theta) = \cos\theta$
* $\tan(360+\theta) = \tan\theta$
* $\operatorname{cosec}(360+\theta) = \operatorname{cosec}\theta$
* $\sec(360+\theta) = \sec\theta$
* $\cot(360+\theta) = \cot\theta$



$\sin x = -\frac{4}{5}$

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

$\operatorname{cosec} x = -\frac{5}{4}$

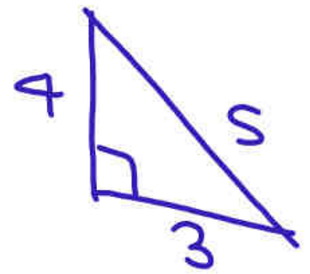
$\sec x = -\frac{5}{3}$

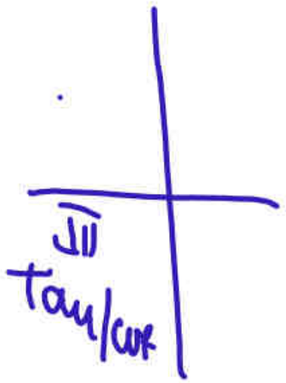
$\cot x = \frac{3}{4}$

1. If $\cos x = -\frac{3}{5}$, x lies in the third quadrant, find the values of other five trigonometric functions.

B

H





$\sin\theta = \frac{12}{13}$

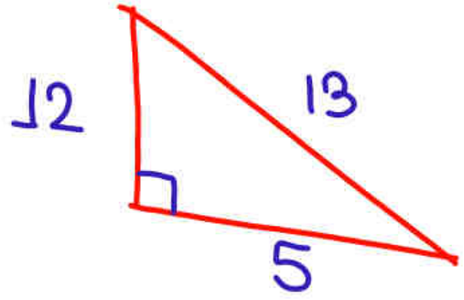
$\operatorname{cosec}\theta = \frac{13}{12}$

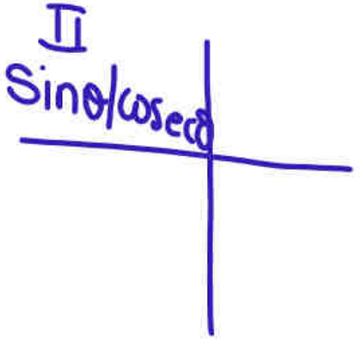
$\sec\theta = -\frac{13}{5}$

$\tan\theta = -\frac{12}{5}$

$\cot\theta = -\frac{5}{12}$

2. If $\cos x = -\frac{5}{13}$, x lies in the second quadrant, find the values of other five trigonometric functions.





* $\sin 210^\circ$

$= \sin(180+30^\circ)$

$= -\sin 30^\circ$

$= -\frac{1}{2}$

or

$\sin 210^\circ$

$= \sin(270-60^\circ)$

$= -\cos 60^\circ$

$= -\frac{1}{2}$

* $\sin 150^\circ$

$= \sin(90+60^\circ)$

$= \cos 60^\circ$

$= \frac{1}{2}$

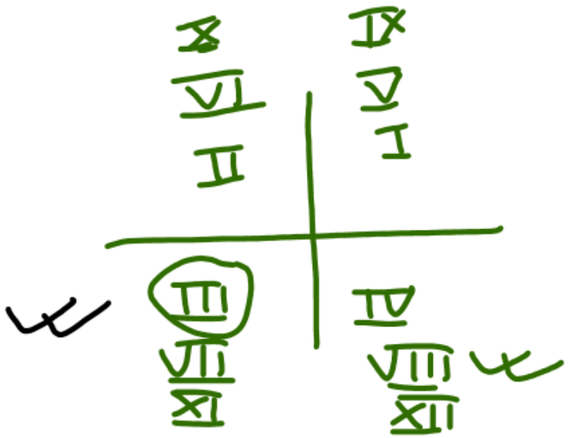
* $\sin 390^\circ$

$= \sin(360+30^\circ)$

$= \sin 30^\circ$

$= \frac{1}{2}$

* $\sin 100^\circ = +\cos 10^\circ$
* $\sin 190^\circ = -\sin 10^\circ$
* $\sin 200^\circ = -\sin 20^\circ$
* $\sin 280^\circ = -\cos 10^\circ$
* $\sin 390^\circ = +\sin 30^\circ$
* $\sin 570^\circ = -\sin 30^\circ$
* $\sin 680^\circ = -\cos 50^\circ$
* $\sin 930^\circ = -\sin 30^\circ$



II ← $100^\circ = 90 \times 1 + 10^\circ$

III ← $190^\circ = 90 \times 2 + 10^\circ$

III ← $200 = 90 \times 2 + 20$

IV ← $280 = 90 \times 3 + 10^\circ$

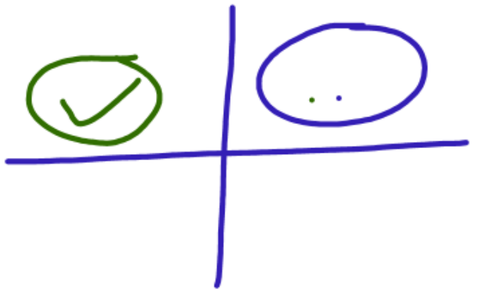
V $390 = 90 \times 4 + 30^\circ$

VII ← $570 = 90 \times 6 + 30^\circ$

$680 = 90 \times 7 + 50^\circ$

II ← $930 = 90 \times 10 + 30$

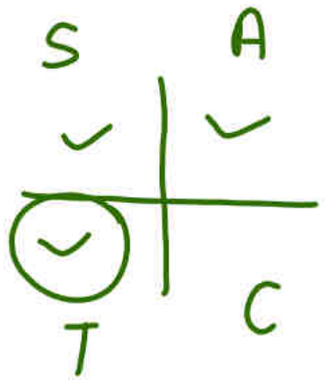
$\sin(1450^\circ) = \sin 10^\circ$



* $\tan(1540^\circ) = -\cot 10^\circ$

$1450 = 90 \times 16 + 10^\circ$

$18 \leftarrow 1540^\circ = 90 \times 17 + 10^\circ$



3. The value of $\sin 960^\circ \cos 330^\circ + \cos 120^\circ \sin 150^\circ$ is :

(a) -1 **(b) 1**

(c) $\frac{1}{\sqrt{2}}$ **(d) $\frac{\sqrt{3}}{2}$**

$= \sin 960^\circ \cdot \cos 330^\circ + \cos 120^\circ \cdot \sin 150^\circ$

$= \sin(90\times10+60^\circ)\cdot\cos(90\times3+60^\circ) + \cos(90\times1+30^\circ)\cdot\sin(90\times1+60^\circ)$

$= -\sin 60^\circ \cdot \sin 60^\circ - \sin 30^\circ \cos 60^\circ$

$= -\frac{\sqrt{3}}{2}\cdot\frac{\sqrt{3}}{2} - \frac{1}{2}\times\frac{1}{2}$

$= -\frac{3}{4} - \frac{1}{4} = -\frac{4}{4} = -1$

$\sin \frac{31\pi}{3}$

$= \sin \frac{31 \times 180^{60}}{3}$

$= \sin 1860^\circ$

$= \sin (90 \times 20 + 60^\circ)$

$= + \sin 60^\circ$

$= \frac{\sqrt{3}}{2}$

4. Find the value of $\sin \frac{31\pi}{3}$.

(a) 1 **(b) $\frac{1}{2}$**

(c) $\frac{\sqrt{3}}{2}$ **(d) 0**

$= \cos 1710^\circ$

$= \cos(90 \times 19 + 0^\circ)$

$= -\sin 0$

$= 0$

5. Find the value of $\cos(-1710^\circ)$.

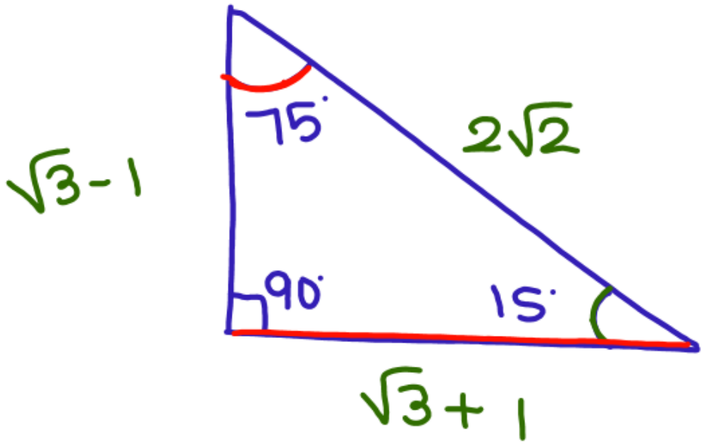
(a) 0 ✓

(b) 1

(c) -1

(d) $\frac{1}{2}$

Value of 15° & 75°



$\sin 15^\circ = \frac{\sqrt{3}-1}{2\sqrt{2}}$

$\cos 15^\circ = \frac{\sqrt{3}+1}{2\sqrt{2}}$

$\sin 75^\circ = \frac{P}{H} = \frac{\sqrt{3}+1}{2\sqrt{2}}$

6. **Solve $\tan\frac{13\pi}{12}$.**

(a) $2+\sqrt{3}$ **(b)** $2-\sqrt{3}$

(c) $\sqrt{3}$ **(d)** $\sqrt{3}+1$

$= \tan\frac{13\times 180^{15}}{12}$

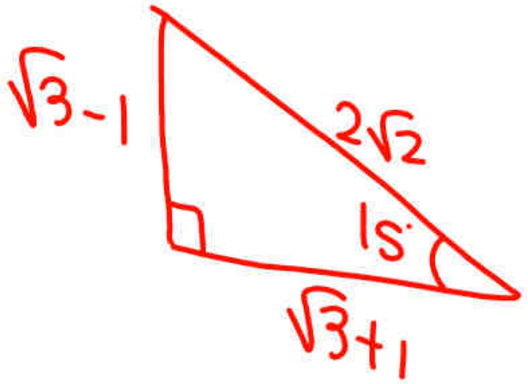
$= \tan 195^\circ$

$= \tan(90\times 2+15^\circ)$

$= \tan 15^\circ$

$= \frac{\sqrt{3}-1}{\sqrt{3}+1}\times\frac{\sqrt{3}-1}{\sqrt{3}-1} = \frac{(\sqrt{3}-1)^2}{(\sqrt{3})^2-(1)^2}$

$= \frac{4-2\sqrt{3}}{2} = 2-\sqrt{3}$



$\sin(90+60^\circ)$

$= \cos 60^\circ$

7. Find $3\sin\frac{\pi}{6}\sec^2\frac{\pi}{3} - 4\sin\frac{5\pi}{6}\cot\frac{\pi}{4}$?

(a) 4 **(b) 0**

(c) – 1 **(d) 2**

$= 3\sin 30^\circ \cdot \sec^2 60^\circ - 4\sin 150^\circ \cdot \cot 45^\circ$

$= 3 \times \frac{1}{2} \cdot 4 - 4 \times \frac{1}{2} \cdot 1$

$= 6 - 2 = 4$

$\sin^2 60 + \cos^2 45$

$= \frac{3}{4} + \frac{1}{2}$

$= \frac{10}{8} = \frac{5}{4}$

8. **Find $\sin^2 \frac{\pi}{3} + \cos^2 \frac{\pi}{4} = ?$**

(a) $\frac{1}{2}$

(b) $\frac{5}{4}$

(c) 1

(d) -1

$\sin(90+45^\circ)$
$= \cos 45^\circ$

9. Find $2\sin^2\frac{3\pi}{4} + 2\cos^2\frac{\pi}{4} + 2\cos^2\frac{\pi}{3} = ?$

(a) 4 **(b) 5**

(c) $\frac{5}{2}$ **(d) 6**

$= 2 \times \sin^2 135^\circ + 2\cos^2 45^\circ + 2\cos^2 60^\circ$

$= 2\times\left(\frac{1}{\sqrt{2}}\right)^2 + 2\times\left(\frac{1}{\sqrt{2}}\right)^2 + 2\times\left(\frac{1}{2}\right)^2$

$= 2\times\frac{1}{2} + 2\times\frac{1}{2} + 2\times\frac{1}{4}$

$= 1+1+\frac{1}{2} = 2+\frac{1}{2} = \frac{5}{2}$

10. H.W

Find $2\sin^2\frac{\pi}{6} + \text{cosec}^2\frac{7\pi}{6}\cos^2\frac{\pi}{3} = ?$

(a) 1

(b) $\frac{1}{2}$

(c) $-\frac{1}{2}$

(d) $\frac{3}{2}$

11. H·W

Find $\cot^2\frac{\pi}{6} + \operatorname{cosec}^2\frac{5\pi}{6} + 3\tan^2\frac{\pi}{6} = ?$

(a) 6
(b) 4
(c) 5
(d) 3

$= \frac{-\cos x \times \cos x}{\sin x \,(-\sin x)}$

$= \frac{\cos^2 x}{\sin^2 x} = \cot^2 x$

12. Find $\dfrac{\cos(\pi + x)\cos(-x)}{\sin(\pi - x)\cos\left(\frac{\pi}{2} + x\right)} = ?$

(a) $\sin^2 x$ **(b)** $\tan^2 x$

(c) $-\cot^2 x$ **(d)** $\cot^2 x$

$\cos(180+\theta) = \cos(90\times 2+\theta)$

$= -\cos\theta$

ot

13. $\sin 15^\circ + \cos 105^\circ =$

(a) 0 **(b) $2 \sin 15^\circ$**

(c) $\cos 15^\circ + \sin 15^\circ$ **(d) $2 \cos 15^\circ$**

$= \sin 15^\circ + \cos(90 + 15^\circ)$

$= \sin 15^\circ - \sin 15^\circ$

$= 0$

$-\cos\theta$ and $\cos(-\theta) = \cos\theta$

Sinθ	A
90-180	0-90
180-270	270-360
Tanθ	Cosθ

14. $\cos 25^\circ + \cos 5^\circ + \cos 175^\circ + \cos 205^\circ + \cos 300^\circ = ?$

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$

(c) $\frac{\sqrt{3}}{2}$ (d) 1

$= \cos 25^\circ + \cos 5^\circ + \cos(180-5) + \cos(180+25) + \cos(360-60)$

$= \cos 25^\circ + \cos 5^\circ - \cos 5^\circ - \cos 25^\circ + \cos 60^\circ$

$= \frac{1}{2}$

15. $$\frac{\cos\left(\frac{\pi}{2}-3A\right)-\cos\left(\frac{\pi}{2}+A\right)}{\cos A+\cos(\pi+3A)}=?$$

(a) $\tan 2A$ (b) $\cot A$

(c) $\tan 2A$ (d) $\cot 2A$

$$=\frac{\cos(90-3A)-\cos(90+A)}{\cos A+\cos(180+3A)}$$

$$=\frac{\sin 3A+\sin A}{\cos A-\cos 3A}$$

$$=\frac{2\sin\left(\frac{3A+A}{2}\right)\cdot\cos\left(\frac{3A-A}{2}\right)}{2\sin\left(\frac{A+3A}{2}\right)\cdot\sin\left(\frac{3A-A}{2}\right)}$$

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

* $\sin C + \sin D = 2\sin\left(\frac{C+D}{2}\right)\cdot\cos\left(\frac{C-D}{2}\right)$

* $\sin C - \sin D = 2\sin\left(\frac{C-D}{2}\right)\cdot\cos\left(\frac{C+D}{2}\right)$

* $\cos C + \cos D = 2\cos\left(\frac{C+D}{2}\right)\cos\left(\frac{C-D}{2}\right)$

* $\cos C - \cos D = 2\sin\left(\frac{C+D}{2}\right)\cdot\sin\left(\frac{D-C}{2}\right)$

16. **If ABCD is a cyclic quadrilateral then cosA + cosB + cosC + cosD = ?**

(a) 2(cosA + cosC) (b) 2(cosD + cosB)

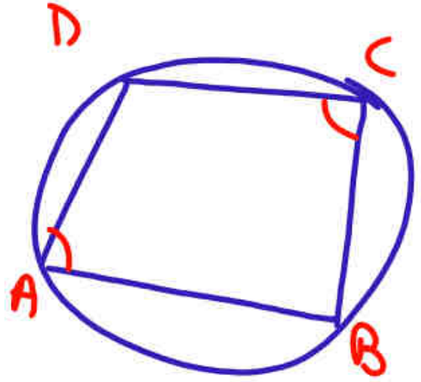
(c) 2(sinA + sinC) (d) 0

$= \cos A + \cos B + \cos C + \cos D$

$= \cos A + \cos(180 - D) + \cos(180 - A) + \cos D$

$= \cancel{\cos A} - \cancel{\cos D} - \cancel{\cos A} + \cancel{\cos D}$

$= 0$



$\angle A + \angle C = 180^\circ$

$\angle B + \angle D = 180^\circ$

17. $\tan\theta \sin\left(\frac{\pi}{2}+\theta\right)\cos\left(\frac{\pi}{2}-\theta\right) = ?$

(a) 1 (b) 0

(c) $\cos\theta$ (d) $\sin^2\theta$

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

18. $\tan A + \tan(180° + A) + \cot(90° + A) + \cot(360° - A) = ?$

(a) 0 **(b) 2 tanA**

(c) 2 cotA **(d) tamA – cotA**

$\tan A + \tan A - \tan A - \cot A$

$= \tan A - \cot A$

$\cot\frac{6\pi}{7}$

$= \cot\left(\pi - \frac{\pi}{7}\right)$

$= -\cot\frac{\pi}{7}$

$\cot\frac{5\pi}{7}$

$= \cot\left(\pi - \frac{2\pi}{7}\right)$

$= -\cot\frac{2\pi}{7}$

19. $\cot\frac{\pi}{7} + \cot\frac{2\pi}{7} + \cot\frac{3\pi}{7} \ldots\ldots\ldots + \cot\frac{6\pi}{7}$

$= ?$

(a) 0 (b) 1

(c) -1 (d) 2

$\cot\frac{\pi}{7} + \cot\frac{2\pi}{7} + \cot\frac{3\pi}{7} + \cot\frac{4\pi}{7} + \cot\frac{5\pi}{7} + \cot\frac{6\pi}{7}$

$= \cot\frac{\pi}{7} + \cot\frac{2\pi}{7} + \cot\frac{3\pi}{7} - \cot\frac{3\pi}{7} - \cot\frac{2\pi}{7} - \cot\frac{\pi}{7}$

$= 0$

$\cos\theta + 2\cos\theta + 4\cos\theta$

$= \cos\theta(1+2+4)$ ✓

$\cos 10^\circ + \cos 20^\circ + \cos 30^\circ$

$\cos 10^\circ(1+2+3)$ ✗

20. $\sin^2\frac{\pi}{8} + \sin^2\frac{3\pi}{8} + \sin^2\frac{5\pi}{8} + \sin^2\frac{7\pi}{8} = ?$

(a) $\frac{1}{2}$ (b) 2

(c) $\frac{3}{2}$ (d) $\frac{3}{4}$

$= \frac{1-\cos\frac{\pi}{4}}{2} + \frac{1-\cos\frac{3\pi}{4}}{2}$

$+ \frac{1-\cos\frac{5\pi}{4}}{2} + \frac{1-\cos\frac{7\pi}{4}}{2}$

$= \frac{1}{2}\left[1-\cos\frac{\pi}{4} + 1-\cos\frac{3\pi}{4} + 1+\cos\frac{\pi}{4} + 1+\cos\frac{3\pi}{4}\right]$

$= \frac{1}{2}[4]2$

$= 2$

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

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

$\sin^2\theta = \frac{1-\cos 2\theta}{2}$

$$A + B = 90^\circ$$

$$\sin^2 A + \sin^2 B = 1$$

EX:- $\sin^2 10^\circ + \sin^2 80^\circ = 1$

मान ⊥ sec

$= 2\left(\sin^2\frac{\pi}{8} + \sin^2\frac{3\pi}{8}\right)$

$= 2 \times 1$

20. $\sin^2\frac{\pi}{8} + \sin^2\frac{3\pi}{8} + \sin^2\frac{5\pi}{8} + \sin^2\frac{7\pi}{8} = ?$

(a) $\frac{1}{2}$

(b) 2

(c) $\frac{3}{2}$

(d) $\frac{3}{4}$

$\frac{4}{3}\cot^2 30^\circ + 3\cos^2(90+60^\circ) - 4\times 2 + 8\times 1$

$= \frac{4}{3}\times 3 + 3\times \sin^2 60^\circ - 8 + 8$

$= 4 + 3\times \frac{3}{4} = \frac{25}{4}$

21. What is the value of $\frac{4}{3}\cot^2\frac{\pi}{6} + 3\cos^2 150^\circ - 4\text{cosec}^2 45^\circ + 8\sin\frac{\pi}{2}$?

(a) $\frac{25}{4}$ (b) 1

(c) $-\frac{7}{2}$ (d) $\frac{13}{2}$

$$\sin 2\theta = 2\sin\theta \cdot \cos\theta$$

$$\cos 2\theta = \cos^2\theta - \sin^2\theta$$

$= \frac{2 \times \sin 2A \times \cos 2A}{-\sin 4A}$

$= \frac{\sin 4A}{-\sin 4A} = -1$

22. What is the value of

$$\frac{\left[\{4\cos(90-A)\sin^3(90+A)\}-\{4\sin(90+A)\cos^3(90-A)\}\right]}{\cos\left(\frac{180+8A}{2}\right)}$$

(a) 1 **(b) – 1**

(c) 0 **(d) 2**

$\frac{4\sin A\cos^3 A - 4\cos A \cdot \sin^3 A}{-\sin 4A}$

$= \frac{2\times 2\sin A\cos A(\cos^2 A - \sin^2 A)}{-\sin 4A}$

$= -\frac{\cancel{4}^{2} \times 1}{\cancel{2}}\left(\frac{3}{4} - \frac{1}{4}\right)$

$= -\frac{2 \times \cancel{2}}{\cancel{4}} = -1$

22. What is the value of

$$\frac{\left[\left\{4\cos(90 - A)\sin^3(90 + A)\right\} - \left\{4\sin(90 + A)\cos^3(90 - A)\right\}\right]}{\cos\left(\frac{180 + 8A}{2}\right)}$$

let $A = 30^\circ$

(a) 1 (b) – 1

(c) 0 (d) 2

$$= \frac{4\cos 60^\circ \cos^3 30 - 4\cos 30^\circ \cdot \cos^3 60^\circ}{-\cos 30^\circ}$$

$$= \frac{4\cos 30^\circ \cos 60^\circ (\cos^2 30 - \cos^2 60^\circ)}{-\cos 30^\circ}$$

$\tan\frac{\pi}{4} \times \tan\frac{3\pi}{4}$

$= \tan\frac{\pi}{4} \times \tan\left(\pi - \frac{\pi}{4}\right)$

$= 1 \times \left(-\tan\frac{\pi}{4}\right)$

$= 1 \times (-1) = -1$

23. What is the value of

$$\tan\left(\frac{\pi}{4} + A\right) \times \tan\left(\frac{3\pi}{4} + A\right) ?$$

(a) 0 **(b) 1**

(c) $\frac{\cot A}{2}$ **(d) – 1** ✓

24. What is the value of sin (630° + A) + cosA?

(a) $\sqrt{\frac{3}{2}}$ (b) $\frac{1}{2}$

(c) 0 (d) $2\sqrt{3}$

$= \sin(630+A) + \cos A$

$= \sin(90\times7+A) + \cos A$

$= -\cos A + \cos A$

$= 0$

$A = 0$
$B = 0$

25. What is the value of $\cos(90 - B)\sin(C - A) + \sin(90 + A)\cos(B + C) - \sin(90 - C)\cos(A + B)$?

(a) 1 **(b) $\sin(A + B - C)$**

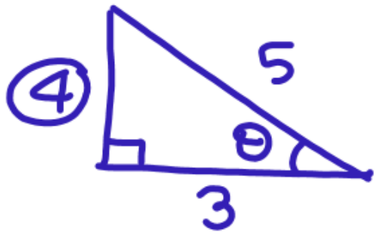
(c) $\cos(B + C - A)$ **(d) 0**

$= \underbrace{\sin B \cdot \sin(-A)}_{0} + \cos A \cdot \cos(B+C) - \cos C \cdot \cos(A+B)$

$= 0 + \cos C - \cos C$

$= 0$

$\cos\theta = \frac{3}{5}$



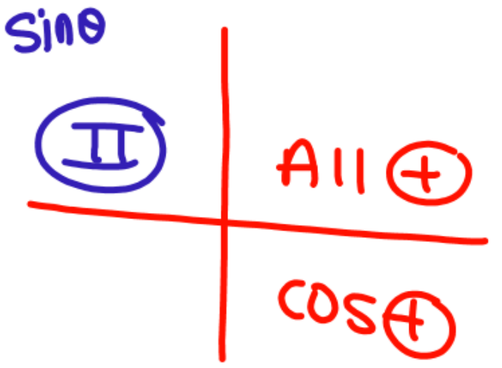
$\sin\theta = \frac{4}{5}$

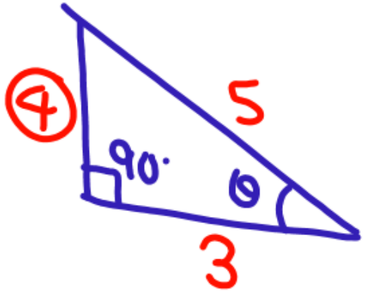
$\tan\theta = \frac{4}{3}$

$\cos\theta = -\frac{3}{5}$ $\quad 90° < \theta < 180°$

$\sin\theta = +\frac{4}{5}$

$\tan\theta = -\frac{4}{3}$





$2\times\tan^2x - 3\operatorname{cosec}^2x$

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

$= 2\times 3 - 3\times\frac{4}{3}$

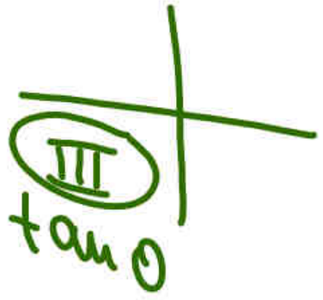
$= 2$

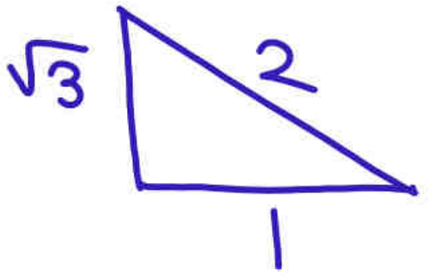
26. If $\cos x = -\frac{1}{2}$ and $\pi < x < \frac{3\pi}{2}$, then the value of $2\tan^2x - 3\operatorname{cosec}^2x$ is :

SSC CHSL 8 July 2019 (Morning)

(a) 2 (b) 10

(c) 8 (d) 4





$= 2\cot^2 x + 3\sec^2 x$

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

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

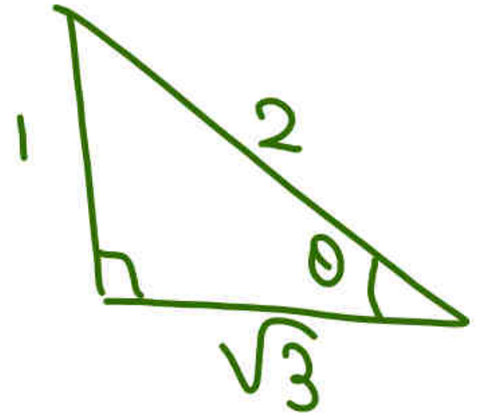
$= 10$

27. **If $\cos x = -\frac{\sqrt{3}}{2}$ and $\pi < x < \frac{3\pi}{2}$, then the value of $2\cot^2 x + 3\sec^2 x$ is :**

SSC CHSL 8 July 2019 (Afternoon)

(a) 10 **(b) 4**

(c) 8 **(d) 16**



Use Optim

28. **Find x if $\cos x = -\frac{1}{2}$.**

SSC CHSL 15/10/2020 (Evening)

ⓐ $\cos(180+90^\circ) = -\cos 90$
$= 0$

ⓑ $\cos(90+30^\circ) = -\sin 30^\circ$
$= -\frac{1}{2}$

(a) $\frac{3\pi}{2} = 270^\circ$

(b) $\frac{2\pi}{3} = 120^\circ$

(c) $\frac{5\pi}{2} = 450^\circ$

(d) $\frac{4\pi}{3} = 240^\circ$

By Method

28. Find x if $\cos x = -\frac{1}{2}$. $x < \pi$

SSC CHSL 15/10/2020 (Evening)

$\cos x = -\cos 60^\circ$

$= \cos(180 - 60^\circ)$

$= \cos 120^\circ$

(a) $\frac{3\pi}{2} = 270^\circ$

(b) $\frac{2\pi}{3} = 120^\circ$

(c) $\frac{5\pi}{2} = 450^\circ$

(d) $\frac{4\pi}{3} = 240^\circ$