Mains Special Batch

Trigonometry

$S+S^2=1$

If $\sin A + \dfrac{1}{(1+\cot^2 A)} = (\sec^2 A - 1)$ $(\operatorname{cosec}^2 A - 1)$ then find the value of

$\cos^8 A + 2\cos^6 A + \cos^4 A + 2$

(a) 3 (b) 0

(c) 2 (d) 1

(A)

3 (A)

① Cube → 3 → बीच वाली Power का coeff. 3

आएगा।

② Square → — — — बीच वाली Power के साथ 2 आएगे।

$S + S^2 = 1$

$S = C^2$

$S^4 + 2S^3 + S^2 + 2$

$(S^2 + S)^2 + 2$

$1^2 + 2 = 3$

If $\sin A + \dfrac{1}{(1 + \cot^2 A)} = (\sec^2 A - 1)$ $(\operatorname{cosec}^2 A - 1)$ then find the value of $\cos^8 A + 2\cos^6 A + \cos^4 A + 2$

(a) 3 (b) 0

(c) 2 (d) 1

3 (A)

If $\operatorname{cosec}\frac{(3A+B)}{2} = \sec\frac{(3A-B)}{2} = \frac{2}{\sqrt{3}}$ then find the value of $\sin(8A+6B)$

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

$\frac{3A+B}{2} = 60^\circ$

$3A+B = 120^\circ$

$3A-B = 2\times 30^\circ = 60^\circ$

$6A = 180^\circ$

$A = 30^\circ \quad B = 30^\circ$

$\sin(0.5A+2.5B) + \cos(\frac{5A+7B}{2})$

$\sin(60A+20B)$

$\sin(0.5A+2.5B)$

$\sin(\frac{5A+7B}{2})$

$\sin(420^\circ)$

$\sin 60^\circ$

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

(A)

If $2\sec^2(2x+10°) = 8\cos^2\theta\ (1+\tan^2\theta)$ then find the value of

$$\frac{\sec^4(x+20)° + \operatorname{cosec}^4(x+20)°}{1-2\sec^2(2x-5)°\operatorname{cosec}^2(2x-5)°}$$

$2\sec^2(2x+10) = 8$

$2x+10 = 60$

$2x = 50$

$x = 25$

(a) $\frac{8}{7}$

(b) $\frac{7}{8}$

(c) $\frac{-8}{7}$

(d) $\frac{-7}{8}$

$\frac{4+4}{1-2\times2\times2} = \frac{8}{-7}$ Ans (c)

Solve

$$2\cos^2\theta + (4+\sqrt{3})\sin\theta - 2(1+\sqrt{3}) = 0$$

where θ is an acute angle.

(a) 30°
(b) 15°
(c) 60°
(d) 45°

$2\times\frac{1}{4}+(1+\sqrt{3})\frac{\sqrt{3}}{2}-2(1+\sqrt{3})$

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

$=0$

Option (c) verify ©

If $\text{cosec}^2A - 10\text{cosec}A + 25 = 0$ then find the value of $25\sin A + 2\sqrt{6}\tan A$

(a) 6 (b) 8

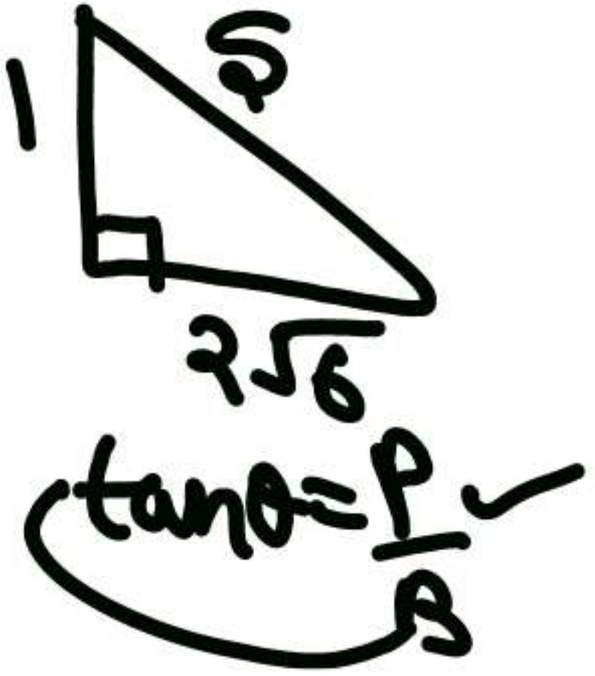
(c) 2 (d) 0

$(\text{Cosec}A - 5)^2 = 0$

$\text{Cosec}A = 5$

$25 \times \frac{1}{5} + 1 = 6$

(A)



The value of

$$\frac{\sin(A-B)}{\cos A \cos B} + \frac{\sin(B-C)}{\cos B \cos C} + \frac{\sin(C-A)}{\cos C \cos A}$$ is

(a) -1

(b) 0

(c) 1

(d) 2

$\frac{\sin A\cos B - \cos A\sin B}{\cos A\cos B}$

$\tan A - \tan B + \tan B - \tan C + \tan C - \tan A$

0

① value

$A=B=C=0$

0

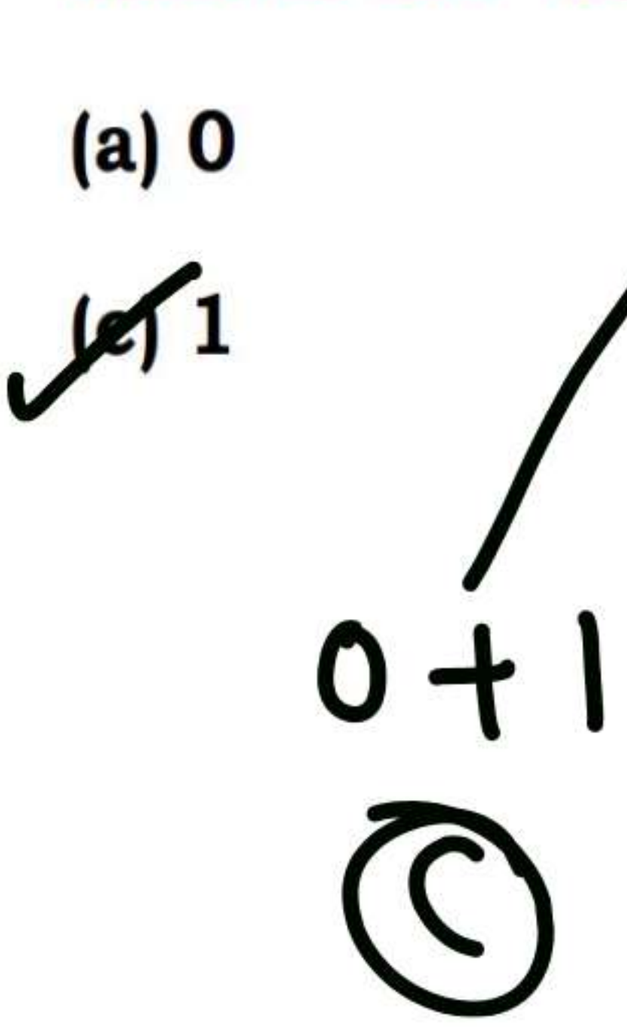
If triangle ABC is right angled at C. then what is the value of cos(A+B) + sin(A+B)?

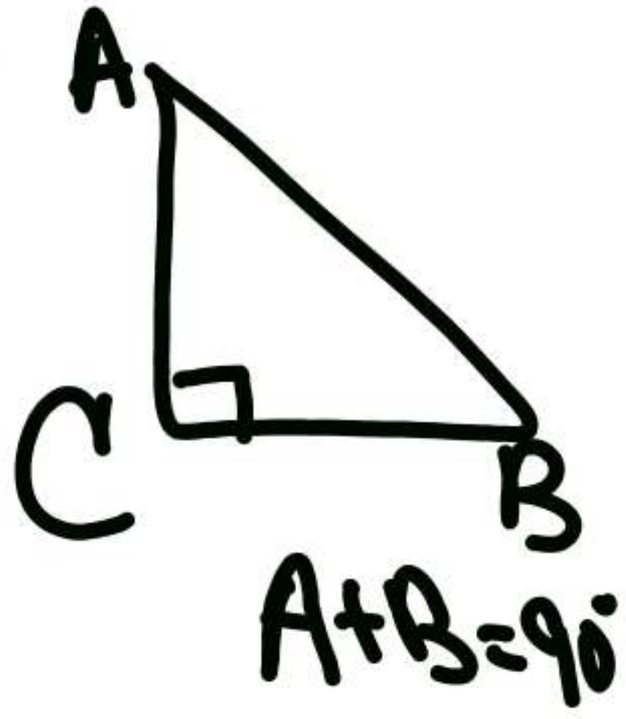
(a) 0

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

(c) 1

(d) 2





If $\frac{3}{(1+\cot^2 A)} + \frac{4}{(1+\tan^2 A)} = 3$ then the value of cotA (where $0° < \theta \leq 90°$) is

(a) ∞ (b) 0

(c) Not defined (d) 1

$3S^2 + 4C^2 = 3$

$\theta = 90°$

$\cot 90° = 0$

(B)

If $8\sin^2\theta + 2\cos\theta = 5, 0° < \theta < 90°$, then the value of $\tan^2\theta + \sec^2\theta - \sin^2\theta$ will be.

$8(1-c^2)+2c=5$

$8-8c^2+2c=5$

$8c^2-2c-3=0$

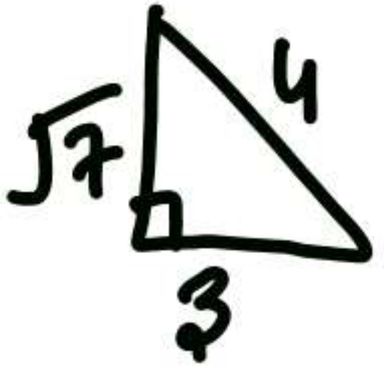
$8c^2-6c+4c-3=0$

$2c(4c-3)+1(4c-3)=0$

$(2c+1)(4c-3)=0$

$c=-\frac{1}{2}$ ✗

$c=\frac{3}{4}$



(a) $\frac{305}{144}$

(b) $\frac{431}{144}$

(c) $\frac{153}{72}$

(d) $\frac{23}{9}$

$\frac{7}{9}+\frac{16}{9}-\frac{7}{16}$

$\frac{23}{9}-\frac{7}{16}$

$\frac{368-63}{144}$

$\frac{305}{144}$

If $1+2\cot^2\theta+2\cos\theta\operatorname{cosec}^2\theta=\frac{x}{y}$ then

the value of $\frac{x+y}{x-y}$ =?

(a) $\sec\theta$ (b) $\operatorname{cosec}\theta$

(c) $\cos\theta$ (d) $\tan\theta$

$$1+2\frac{c^2}{s^2}+\frac{2c}{s^2}$$

$$\frac{s^2+c^2+c^2+2c}{s^2}$$

$$\frac{(1+c)^2}{(1-c)(1+c)}=\frac{x}{y}$$

$$\frac{1}{c}=\frac{x+y}{x-y}$$

$\sec\theta$

(A)

The value of

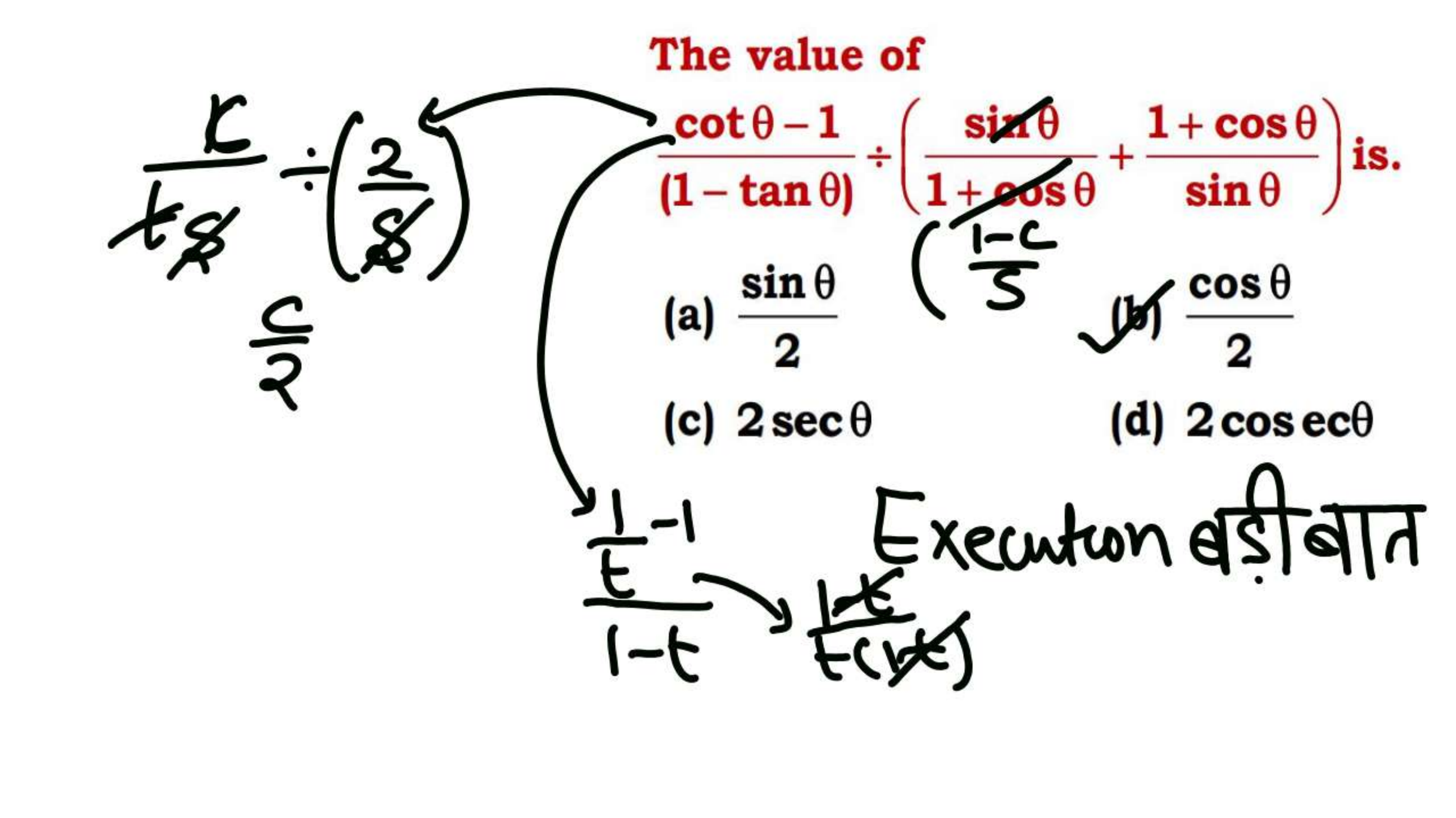
$$\frac{\cot\theta - 1}{(1 - \tan\theta)} \div \left(\frac{\sin\theta}{1 + \cos\theta} + \frac{1 + \cos\theta}{\sin\theta} \right) \text{ is.}$$

(a) $\frac{\sin\theta}{2}$

(b) $\frac{\cos\theta}{2}$

(c) $2\sec\theta$

(d) $2\operatorname{cosec}\theta$



$\frac{1}{x} = s^2$ $\frac{1}{y} = c^2$

If $x = \cos ec^2\theta$,

$y = \sec^2\theta, z = \frac{1}{1 - \sin^2\theta\cos^2\theta}$

then the value of $\frac{1}{x^2} + \frac{1}{y^2}$ is

$s^4 + c^4$

$1 - 2s^2c^2$

$1 - 2\left(\frac{z-1}{z}\right)$

$\frac{2-z}{z}$

$1 - s^2c^2 = \frac{1}{z}$

$s^2c^2 = 1 - \frac{1}{z}$

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

B

(a) $\frac{2+z}{z}$ (b) $\frac{2-z}{z}$

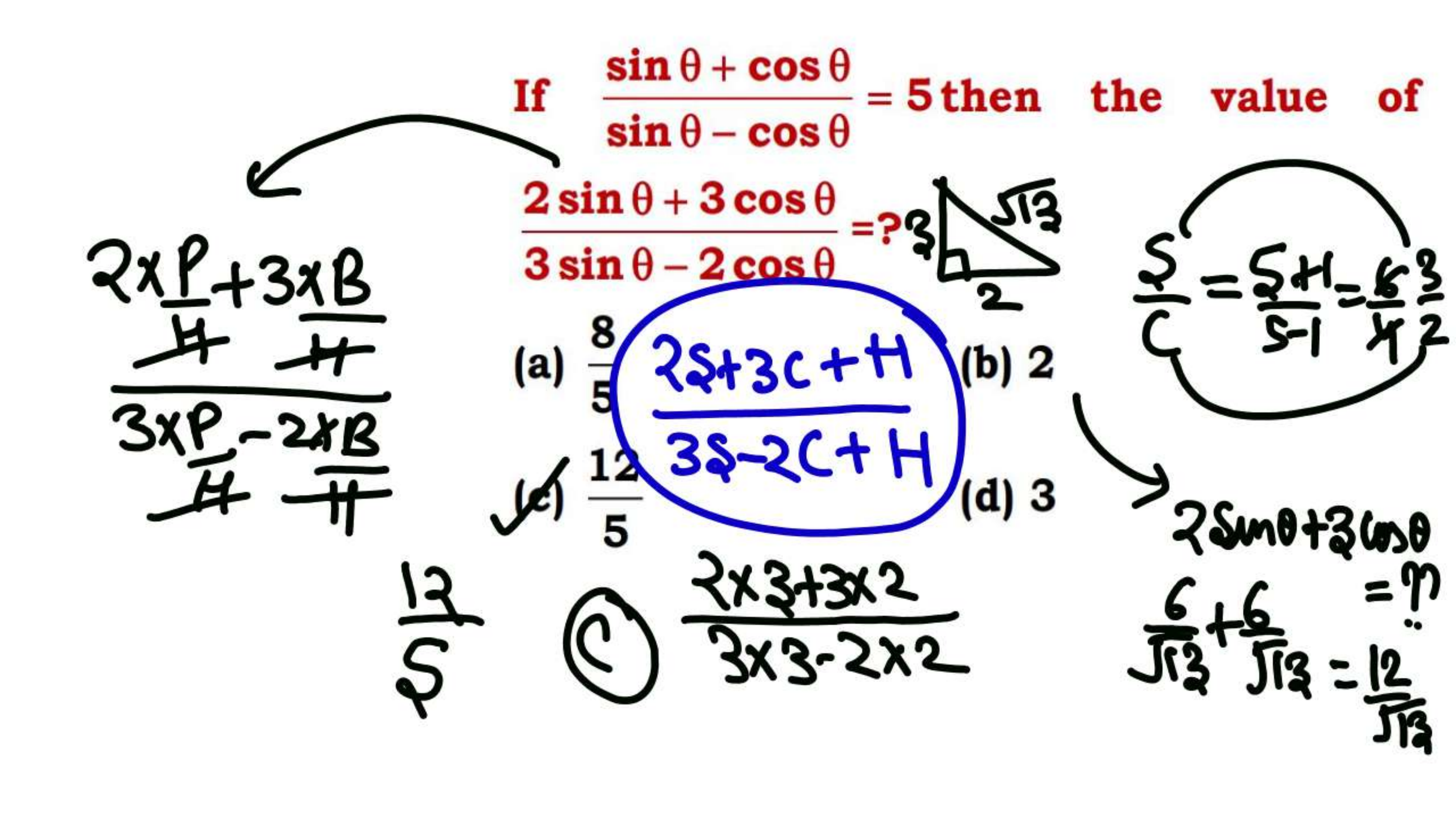
(c) $\frac{z}{2+z}$ (d) $\frac{z}{2-z}$

$$S^6 + C^6 = 1 - 3S^2C^2$$

$$S^4 + C^4 = 1 - 2S^2C^2$$

If $\dfrac{\sin\theta+\cos\theta}{\sin\theta-\cos\theta}=5$ then the value of

$\dfrac{2\sin\theta+3\cos\theta}{3\sin\theta-2\cos\theta}$ =?



(a) $\frac{8}{5}$ (b) 2

(c) $\frac{12}{5}$ (d) 3

$\frac{2S+3C+H}{3S-2C+H}$

$\frac{12}{5}$ (C) $\frac{2\times3+3\times2}{3\times3-2\times2}$

$\frac{2\times\frac{P}{H}+3\times\frac{B}{H}}{3\times\frac{P}{H}-2\times\frac{B}{H}}$

$\frac{S}{C}=\frac{\frac{S}{H}}{\frac{C}{H}}=\frac{5}{1}=\frac{5}{2}$

$\frac{2\sin\theta+3\cos\theta}{\frac{6}{\sqrt{13}}+\frac{6}{\sqrt{13}}}=?$

$=\frac{12}{\sqrt{13}}$

If $a\sin^3\theta + b\cos^3\theta = 8\sin\theta\cos\theta$ and $a\sin\theta - b\cos\theta = 0$ then find the value of a^2+b^2.

(a) 64
(b) 32
(c) 16
(d) 36

$a\sin^2\theta$

$b\cos^2\theta + b\cos^3\theta = 8\sin\theta\cos\theta$

$b\cos^2\theta(\sin^2\theta + \cos^2\theta) = 8\sin\theta\cos\theta$

$b = 8\sin\theta$

$64(\sin^2\theta + \cos^2\theta)$

64

(A)

$a\sin\theta = b\cos\theta$

$a\sin\theta = 8\sin\theta\cos\theta$

$a = 8\cos\theta$

$$\frac{\sqrt{\sin x}+\sqrt{\cos x}}{\sqrt{\sin x}-\sqrt{\cos x}} \times \frac{\sqrt{\sin x}-\sqrt{\cos x}}{\sqrt{\sin x}+\sqrt{\cos x}} = 1 \text{ then}$$

the value of tanx=?

(a) 3 (b) 2

(c) 1 (d) -3

(D)

$$\frac{S}{C} = \frac{1+2}{1-2} = -3$$

$$\frac{2(S+C)}{S-C} = \frac{1}{2}$$

If $\sec\theta + \operatorname{cosec}\theta = 2\sqrt{2}$ then find the value of

$(\cos^4\theta + \sin^4\theta)\operatorname{cosec}^2\theta \sec^2\theta + 6\sin^2\theta\cos^2\theta$

(a) 3.5

(b) $\frac{9}{5}$

(c) 2.5

(d) 1.5

$\theta = 45°$

$\left(2 \times \frac{1}{4}\right) 4 + 6 \times \frac{1}{4}$

$2 + 1.5$

A

If $\tan^4\theta + \sin^2\theta = 1$, and $\theta < 90°$ then find the value of $\cos^2\theta(\cos\theta + 1) = ?$

(a) 2
(c) 1
(b) 0
(d) 3

$t^4 = 1 - s^2$
$= c^2$

$c^2(t^2+1)$
$c^2 \sec^2$

© 1

If $x + y = 135°$ and $\sin y + \operatorname{cosec} y = 2$ then find the value of $\sin^6 y + \cos^6 y + \sin^6 x$

(a) 3
(b) 1
(c) 9/8
(d) 33/32

$x = 45°, y = 90°$

$1 + 0 + \frac{1}{8}$

$\frac{9}{8}$ ©

In $a\sin^4x + b\cos^4x = ab/(a+b)$, find the value of tanx=?

$$\frac{a+b}{ab}a s^4 + \frac{b(a+b)}{ab}c^4 = 1$$

$$\frac{a+b}{ab}s^2 s^2 + \frac{b(a+b)}{ab}c^2 c^2 = 1$$

$$s^2 = \frac{b}{a+b}$$

$$c^2 = \frac{a}{a+b}$$

$$t^2 = \frac{b}{a}, \quad t = \pm\sqrt{\frac{b}{a}}$$

(a) $\pm\sqrt{\frac{a}{b}}$

(b) $\pm\sqrt{\frac{b}{a}}$

(c) $\sqrt{ab}$

(d) $\sqrt{(a+b)}$

B

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

$$\frac{1+C}{1-S}\left[S^2+C^2+1^2+2SC-2C-2S\right]$$

$$\frac{1+C}{1-S}\left[2+2SC-2C-2S\right]$$

$$2\,\frac{1+C}{1-S}\left[1-C-S+SC\right]$$

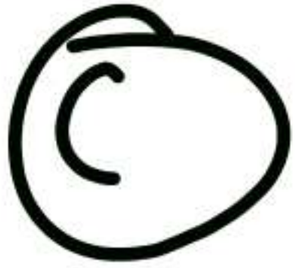
$$2\left(\frac{1+C}{1-S}\right)(1-S)(1-C)=2(\sin^2 x)$$

Find the value of (MN) in the following trigonometry expression

$$\frac{(1+\cos x)}{(1-\sin x)}\left(\sin x+\cos x-1\right)^2=M\sin^N x$$

(a) 3 (b) 6

(c) 4 (d) 2



$M=2$

$\times\ N=2$

4

If $\sin^4 x + 2\cos^4 x = \frac{2}{3}$ then what is the value of $\sec^2 x$=?

(a) 2
(b) 3
(c) 1
(d) 4

$(1-c^2)^2 + 2c^4 = \frac{2}{3}$

$1+3c^4-2c^2 = \frac{2}{3}$

$3+9c^4-6c^2 = 2$

$9c^4-6c^2+1 = 0$

$(3c^2-1)^2 = 0$

$3c^2 = 1$

$\sec^2 = 3$

B

If $\sin^4 x + 2\cos^4 x = \frac{2}{3}$ then what is the value of $\sec^2 x$=?

(a) 2
(b) 3
(c) 1
(d) 4

$\frac{3}{2}s^4 + \frac{3}{1}c^4 = 1$

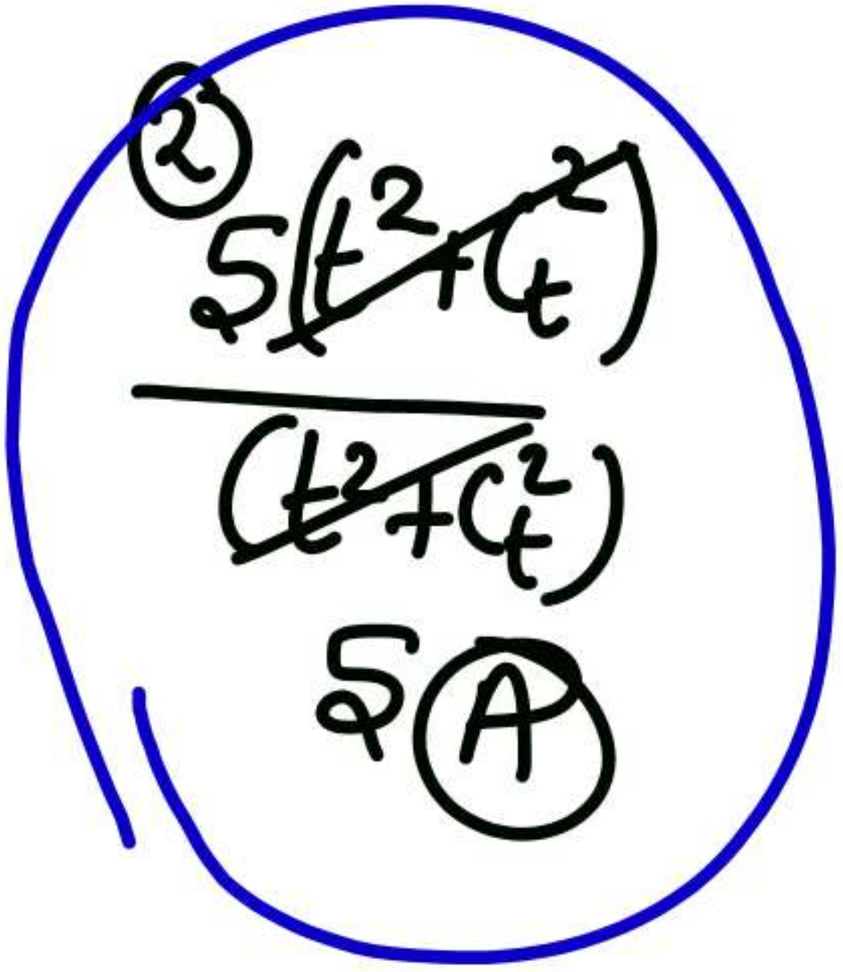
$\left(\frac{3}{2}s^2\right)s^2 + (3c^2)c^2 = 1$

$s^2 = 2$

3

$c^2 = \frac{1}{3}$

$\sec^2 \rightarrow 3$



The value of

$$\left[\frac{(2\tan x+\cot x)^2+(\tan x-2\cot x)^2}{(\tan^2 x+\cot^2 x)}\right] \text{ is}$$

(a) 5
(b) 2
(c) 4
(d) 6

① Value put
$x=45^\circ$

$$\frac{9+1}{2}=5$$

The value of

$$\left[\frac{(2\tan x+\cot x)^2+(\tan x-2\cot x)^2}{(\tan x+\cot x)(\tan^2 x+\cot^2 x)}\right]$$ is

(a) $5\sec x\,\mathrm{cosec}\,x$

(b) $2\cos x\sin x$

(c) $5\sec x$

(d) $5\sin x\cos x$

If $\sin\theta + \sin^2\theta = 1$, find the value of

$$\cos^{12}\theta + 3\cos^{10}\theta + 3\cos^8\theta + \cos^6\theta + 2\cos^4\theta + 2\cos^2\theta - 2$$

(a) 1 (b) 0

(c) 2 (d) –1

$S = c^2$

$1 + 2(c^4 + c^2) - 2$

$1 + 2(s^2 + s) - 2$

$1 + 2 - 2 = 1$

(A)

2 question का Mixture

$$\sqrt{-4+\sqrt{8+16\,\mathrm{cosec}^4\theta+\sin^4\theta}} = A\,\mathrm{cosec}\,\theta + B\sin\theta$$, then A & B will be

(a) 2,–1 (b) –1,2

(c) 3,2 (d) 2,3

$A=2$

$B=-1$

(A)

$$\sqrt{-4+\sqrt{(4\,\mathrm{cosec}^2+\sin^2)^2}}$$

$$\sqrt{4\,\mathrm{cosec}^2+\sin^2-4}$$

$$\sqrt{(2\,\mathrm{cosec}-\sin)^2} = 2\,\mathrm{cosec}-\sin$$

If $3\cos\theta = 5\sin\theta$, then the value of

$$\frac{5\sin\theta - 2\sec^3\theta + 2\cos\theta}{5\sin\theta + 2\sec^3\theta - 2\cos\theta}$$ is

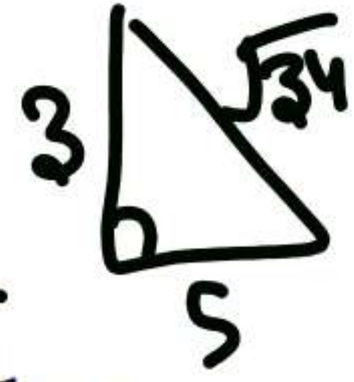
(a) $\frac{271}{979}$

(b) $\frac{316}{2937}$

(c) $\frac{542}{2937}$

(d) None of these

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



$\cos\theta = \frac{5}{\sqrt{34}}$

$\frac{5c - \frac{2}{c^3}}{c + \frac{2}{c^3}}$

$\frac{5c^4 - 2}{c^4 + 2}$

$\frac{5\times625 - 2\times1156}{625 + 2\times1156} = \frac{3125 - 2312}{625 + 2312} = \frac{813}{2937} = \frac{271}{979}$

The value of $\cos^3\theta \sin 3\theta + \sin^3\theta \cos 3\theta$ is

(a) $\frac{3}{4}\sin 4\theta$

(b) $\frac{1}{2}\cos 4\theta$

(c) $\frac{4}{3}\sin 4\theta$

(d) $2\sec 4\theta$

$C^3(3S-4S^3) + S^3(4C^3-3C)$

$3SC^3-4S^3C^3+4S^3C^3-3CS^3$

$3SC(C^2=S^2)$

$3\frac{\sin 2\theta}{2}\cos 2\theta = \frac{3}{2\times 2}\sin 4\theta$

A

The value of $\frac{\cos 9x - \cos 5x}{\sin 17x - \sin 3x} + \frac{\sin 2x}{\cos 10x}$ is

(a) 2 (b) 0

(c) 1 (d) −1

B

$\frac{-2\sin 7x \sin 2x}{2\cos 10x \sin 7x} + \frac{\sin 2x}{\cos 10x}$

The value of $\dfrac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x}$ **is**

(a) cosecx (b) cos2x

(c) cosx (d) 2sinx

$$\frac{s-(3s-4s^3)}{s^2-c^2}$$

$$\cos 2x = 1-2s^2$$
$$= 2c^2-1$$
$$= c^2-s^2$$

$$\frac{4s^3-2s}{s^2-c^2} = \frac{2s(2s^2-1)}{(s^2-c^2)}$$

(D)

$$\frac{(\sin 7x + \sin 5x) + (\sin 9x + \sin 3x)}{(\cos 7x + \cos 5x + \cos 9x + \cos 3x)}$$ is

equal to

(a) cot6x (b) cosecx

(c) tan6x (d) secx

A.P

$$\frac{2\sin\left(\frac{3x+9x}{2}\right)}{\cos\left(\frac{3x+9x}{2}\right)} = \frac{2\sin 3x + 2\sin 5x + 2\sin 7x + 2\sin 9x}{\cos 3x + \cos 5x + \cos 7x + \cos 9x} = \tan 6x$$