Mains Special Batch

Trigonometry

$A+B=90^\circ$

$\sin A=\cos B$

$\tan A\tan B=1$ $\sin A\sec B=1$

$\cos A\operatorname{cosec} B=1$

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

$\sec^2\theta-\tan^2\theta=1$ $\sec^2 A-\cot^2 B=1$

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

$\tan\theta=\dfrac{\sec\theta}{\operatorname{cosec}\theta}$

$\cot\theta=\dfrac{\operatorname{cosec}\theta}{\sec\theta}$

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

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

$$\tan\theta+\cot\theta=\frac{1}{\sin\theta\cos\theta}=\sec\theta\operatorname{cosec}\theta$$

$$\sec^2\theta+\operatorname{cosec}^2\theta=\sec^2\theta\operatorname{cosec}^2\theta=(\tan+\cot)^2$$

Eqn = 0

(Ask) = ??

1. θ की value
2. Triplet
3. Quadratic / Factorisation

If $1 + \sin^2\theta = 4 - \operatorname{cosec}^2\theta$ then find the value of $\dfrac{\left(\sin^6\theta + \operatorname{cosec}^6\theta\right)}{\left(\sin\theta + \operatorname{cosec}\theta\right)}$.

(a) 2
(b) 4
(c) 6
(d) None

$x^2 + \frac{1}{x^2} = 3$

$\dfrac{x^6 + \frac{1}{x^6}}{x + \frac{1}{x}} = \dfrac{18}{\sqrt{5}}$

✓

(D)

If $\sec^2\theta - \cos^2\theta = 5$ then find the value of $\cos^6\theta + \sec^6\theta = ?$

(a) $25\sqrt{28}$

(b) $26\sqrt{29}$

(c) $32\sqrt{35}$

(d) 25

$x^2 - \frac{1}{x^2} = 5$

$x^6 + \frac{1}{x^6} = ??$

$x^2 + \frac{1}{x^2} = \sqrt{5^2+4} = \sqrt{29}$

$29\sqrt{29} - 3\sqrt{29}$

$26\sqrt{29}$

(B)

If $(\tan\theta+\cot\theta)(\tan^2\theta+\cot^2\theta-1)=0$

then find the value of $\tan^{48}\theta+\tan^{55}\theta+\tan^{18}\theta=?$

(a) 0 (b) 1

(c) −1 (d) $\sqrt{3}$

$(a+b)(a^2+b^2-ab)$

a^3+b^3

$t^3+\frac{1}{t^3}=0$

$(-1)^3$

©

$t^6+1=0$

$t^6=-1$

If $1+\tan\theta+\cot\theta=3\tan\theta\cot\theta$ then find the value of $\tan^{11}\theta+\cot^{23}\theta+\tan\theta+\cot\theta$

$1+1+1+1$

(a) 4

(b) 5

(c) 6

(d) 8

$\tan\theta+\cot\theta=3-1$

$=2$

$\theta=45^\circ$

A

If $1.4 \tan\theta = 5.0 \sin\theta$ then find the value of $\operatorname{cosec}\theta + \cot\theta = ?$

(a) 1.33 ✓

(b) 2.30

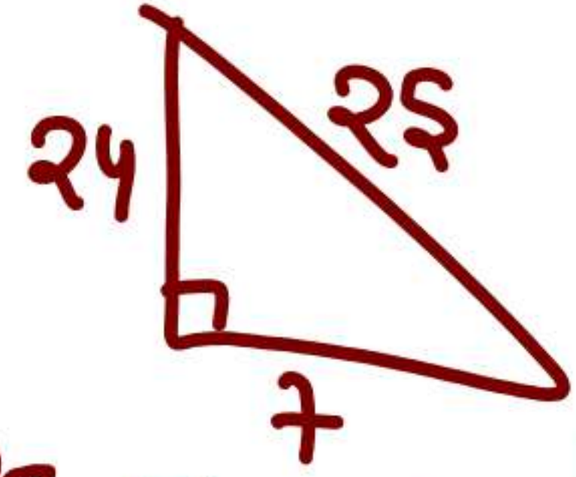
(c) 2.33

(d) 4.21

(A)

$\frac{7}{5} \frac{8}{C} = 5\,8$

$C = \frac{7}{25}$



$\frac{25}{24} + \frac{7}{24} = \frac{32}{24} \frac{4}{3}$ 1.33

If $4\sin x \cos x + 2\sin x + 2\cos x + 1 = 0$ then what will be the value of x =?

(a) 45°

(b) 30°

(c) 120°

(d) 90°

Option (c)

$\theta = 120°$

If $\frac{(\sin^2 39° + \sin^2 51°)}{\cos 36.5°.\sec x°} = \frac{1}{k^2}$ and $k = 3$

then find the value of $x°$=?

(a) 313.5°

(b) 333.5°

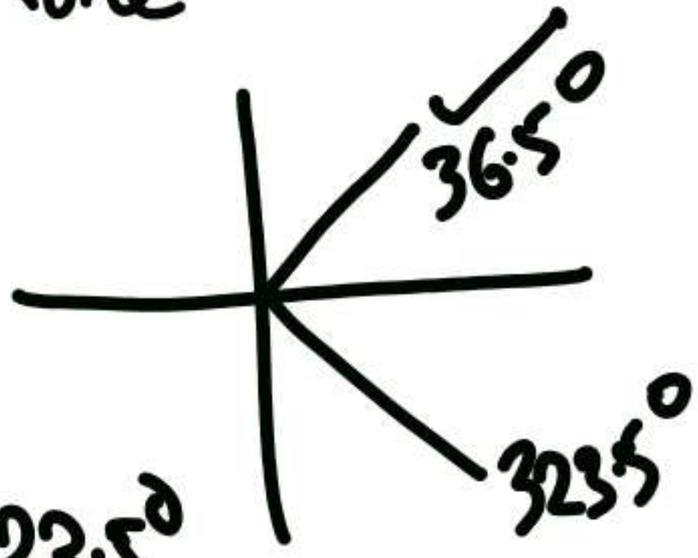
(c) 323.5°

(d) None

(c)

$$\frac{1}{\cos 36.5°} = \sec x$$

$x = 36.5°$ → $360° - 36.5 = 323.5°$



If $6\cot\theta = \sqrt{48}\cos\theta$ then find the value of $\tan^2\theta + \sec^2\theta - \sin^2\theta$ =?

(a) 6.15
(b) 6.25
(c) 5.25
(d) 5.20

B

$\frac{6}{5} = \frac{2\sqrt{3}}{\sqrt{3}}$

$6\sqrt{3} = 5\sqrt{3}$

$\theta = 60°$

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

$7 - 0.75$

6.25

If $\sin\theta + \cos\theta = 3$ then find the value of $\tan\theta + \cot\theta = ?$

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

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

(c) $\frac{1}{4}$

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

$1 + 2SC = 9$

$2SC = 4$

$\frac{1}{SC} = \frac{1}{4}$

The expression

$$\frac{\left(\frac{\sin\theta}{1+\cos\theta}\right)(\cos\theta+\sin\theta)\cot\theta}{(\operatorname{cosec}\theta-\cot\theta)(1+\tan\theta)\operatorname{cosec}\theta}$$

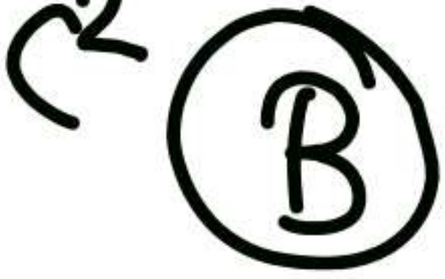
where $0° < \theta$ <90° is equal to

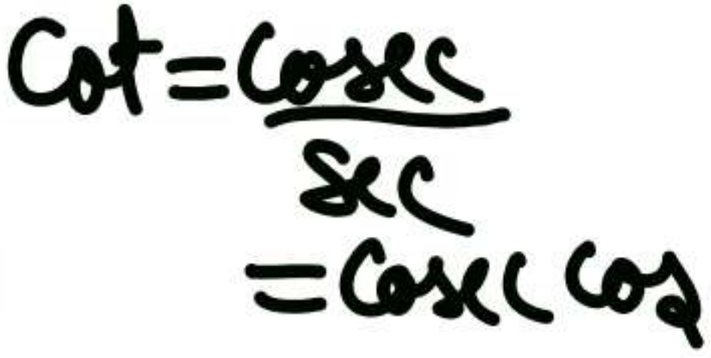
(a) $-\sin^2\theta$

(b) $\cos^2\theta$

(c) $-\cos^2\theta$

(d) $\sin^2\theta$





If $\frac{(\sec\theta - \tan\theta)}{(1+\sin\theta)}\cos\theta = \frac{1}{7}$, θ lies in 1st quadrant, then the value of $\frac{\operatorname{cosec}\theta + \cot^2\theta}{\operatorname{cosec}\theta - \cot^2\theta}$ is

(a) $\frac{19}{5}$

(b) $\frac{37}{12}$

(c) $\frac{37}{19}$

(d) $\frac{22}{3}$

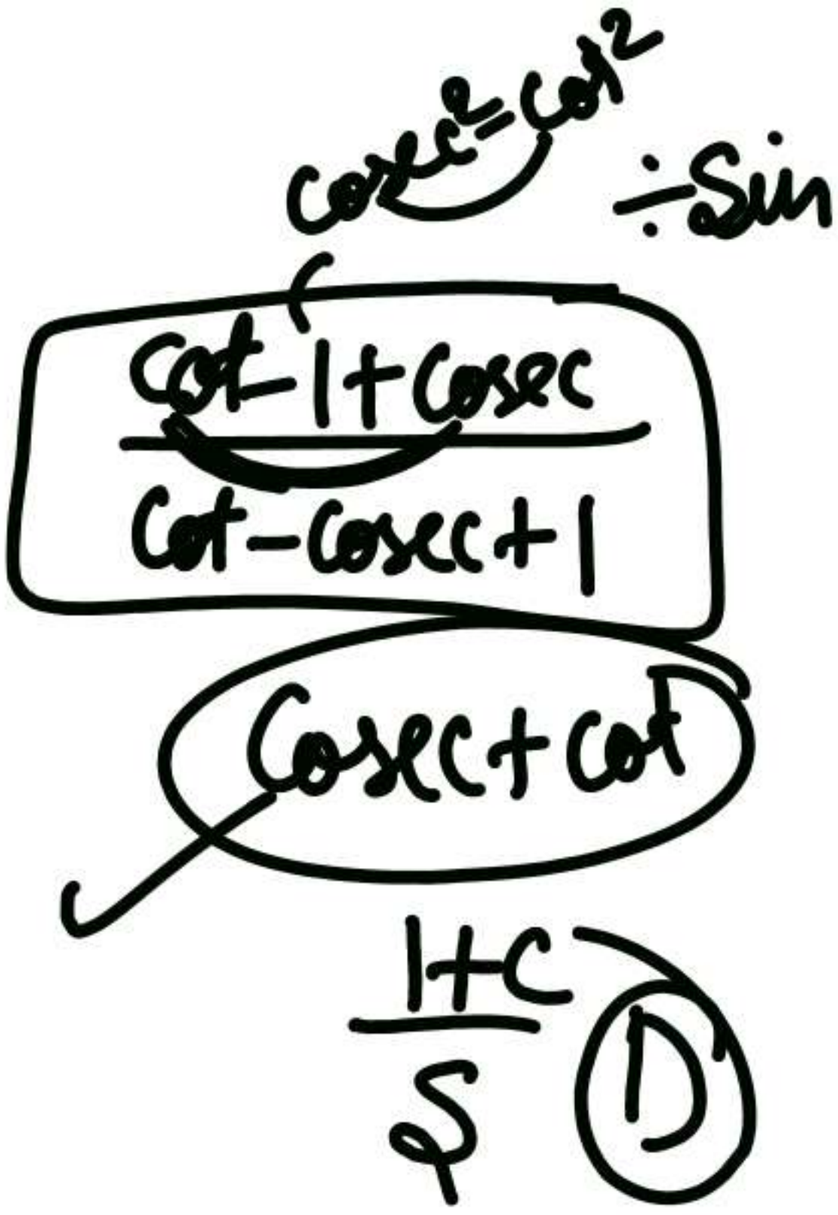
The value of $\frac{(\cos\theta - \sin\theta + 1)}{(\cos\theta - 1 + \sin\theta)}$ is

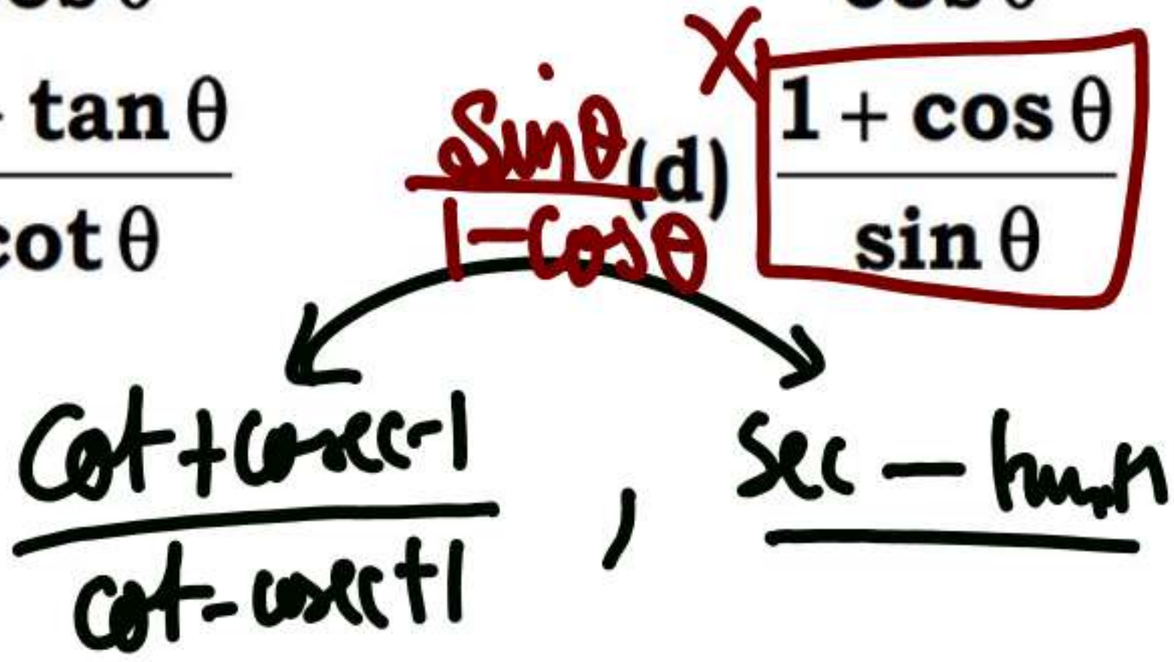
(a) $\frac{1+\sin\theta}{\cos\theta}$

(b) $\frac{1+\cot\theta}{\cos\theta}$

(c) $\frac{1+\tan\theta}{\cot\theta}$

(d) $\frac{1+\cos\theta}{\sin\theta}$





The value of $\frac{(\sin\theta + 1 - \cos\theta)}{(\sin\theta - 1 + \cos\theta)}$ is

÷ cosθ

$\frac{\tan+\sec-1}{\tan-\sec+1}$

$\sec^2 = \tan^2 + 1$

(a) $\frac{1+\sin\theta}{\cos\theta} = \frac{\cos\theta}{1-\sin\theta}$

(b) $\frac{1+\cot\theta}{\cos\theta}$

(c) $\frac{1+\tan\theta}{\cot\theta}$

(d) $\frac{1+\cos\theta}{\sin\theta}$

sec+tan

1+s / c

A

$\frac{S}{H} = \frac{1-C}{S}$

$S \times S = (1-C)(1+C)$

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

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

If $(\tan\theta + \cot\theta)\cos^2\theta - 1 = 14\cos 60°$ then find the value of $\operatorname{cosec}\theta$ = ?

(a) $\sqrt{65}$

(b) 62

(c) $\sqrt{63}$

(d) 60

A

$\left(\frac{1}{\sin\theta}\right)^2 - 1 = 14 \times \frac{1}{2}$

$\cot = 8$

$\sqrt{1+8^2}$

If $\sqrt{\sec^2\theta + \operatorname{cosec}^2\theta} = 4$ then find the value of

$$2\left(\tan^2\theta + \cot^2\theta\right) : \left(2\operatorname{cosec}^2\theta \sec^2\theta - 4\right).$$

(a) 2:3 (b) 3:2

(c) 5:2 (d) 1:1

$\sec\theta \operatorname{cosec}\theta = 4$

$\sec\theta = \frac{1}{4}$

जरूरत नहीं पड़ी

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

$t + \cot = \frac{1}{\sec}$

$\left(\frac{1}{\sin^2\theta} - 2\right)$

D

$\frac{2\left(\frac{1}{\sin^2\theta\cos^2\theta} - 2\right)}{2\left(\frac{1}{\sin^2\theta\cos^2\theta} - 2\right)}$

1:1

The value of the expression

$$\frac{\left(\sin^4\theta - \cos^4\theta + 1\right)}{\left(1 - \sin^2\theta\right)\sec^2\theta}\cos ec^2\theta .$$

(a) 2
(b) 1
(c) 0
(d) –1

$\left[\frac{(S^2-C^2)+1}{2S^2}\right]$ cosec²

Basic के अन्दर

A

कितना छोटा लिखते है.

कितने Step cut करते है.

Solve

$$\frac{\sin^2 39^\circ + \sin^2 51^\circ}{\cos^2 33^\circ + \cos^2 57^\circ} + \frac{\sin(90-\theta)\sin\theta}{\tan\theta} + \frac{\cos(90-\theta)\cos\theta}{\cot\theta}$$

(a) 3 (b) −3

(c) 2 (d) 4

$$\frac{1}{1} + C^2 + S^2$$

C

$\cot = \frac{C}{S}$

$t = \frac{S}{C}$

The value of

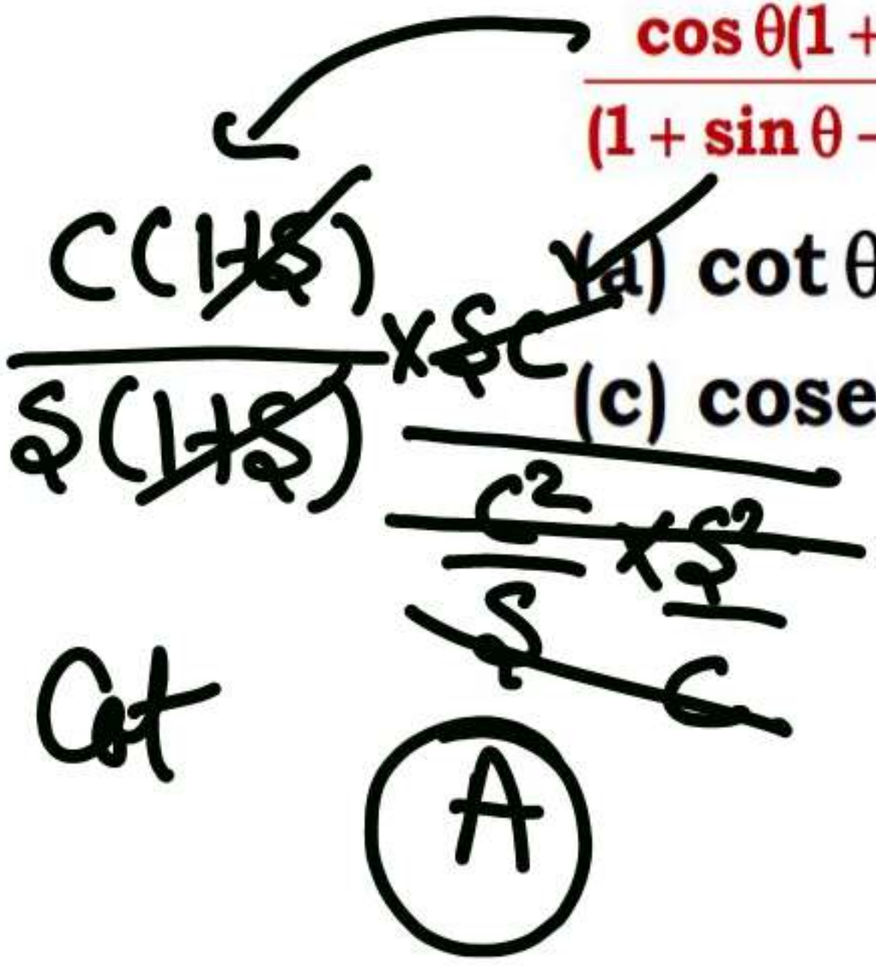
$$\frac{\cos\theta(1+\sin\theta)}{(1+\sin\theta-\cos^2\theta)} \times \frac{(\tan\theta+\cot\theta)^{-1}}{(\operatorname{cosec}\theta-\sin\theta)(\sec\theta-\cos\theta)}$$

(a) $\cot\theta$

(b) $\sin^2\theta$

(c) $\operatorname{cosec}^2\theta$

(d) $\tan\theta$



Evaluate

$$\frac{\cos 105^\circ + \cos 15^\circ}{\sin 36^\circ \cos 9^\circ + \cos 36^\circ \sin 9^\circ}$$

(a) 1

(b) 2

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

(d) $\sqrt{2}$

A

The value of $\cos^2 45° - \sin^2 15°$ is

(a) $\frac{\sqrt{3}}{4}$

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

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

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

$\cos^2 45° - \sin^2 15°$

$\cos 60 \cos 30°$

$\frac{\sqrt{3}}{2} \times \frac{1}{2}$

$\sin^2(A) - \sin^2 B = \sin(A+B) \times \sin(A-B)$

The value of $\dfrac{\cos(A-B)-\cos(A+B)}{\sin(A+B)+\sin(A-B)}$.

(a) sinA
(b) cotB
(c) tanB
(d) secA

$$\frac{+2\sin(A)\sin(B)}{2\sin A\cos B} = \tan B$$

One Step Solution

The value of $\cos 20^\circ \cos 15^\circ \cos 40^\circ \cos 45^\circ \cos 80^\circ$ is

(a) $\frac{\sqrt{3}}{64}$

(b) $\frac{3}{8}$

(c) $\frac{\sqrt{3}}{16}$

(d) $\frac{\sqrt{3}+1}{32}$

D

$\frac{1}{4}\cos 60^\circ \cos 45^\circ \cos 15^\circ$

$\frac{1}{8}\frac{\cos 30+\cos 60}{2} = \frac{1}{16}\left(\frac{\sqrt{3}+1}{2}\right)$

$\cos 3x \cos(60-x)\cos(60+x) = \frac{1}{4}\cos 3x$

The value of the expression

$$\frac{(1-\sec A \operatorname{cosec} A)\sec^2 A.\operatorname{cosec}^2 A}{\{1-(\tan A+\cot A)\}(\tan A+\cot A)^2 \operatorname{cosec}^2 A}$$ is

(a) $\cos^2 A$

(b) $\operatorname{cosec}^2 A$

(c) $\sec^2 A$

(d) $\sin^2 A$

$\frac{1}{\sec^2 x} \times \frac{1}{\sec^2 x}$

$\cos^2$

$\tan + \cot = \frac{1}{\sin}$

D

$= \sec \operatorname{cosec} \sec$

Simplify:

$$\frac{\sin 17x + \sin(180^\circ + 5x) + 2\cos 11x}{2(\cos 3x + \sin 3x)^2}$$

(a) $\cos 11x$ (b) $\sin 5x$

(c) $\sin 17x$ (d) $\cos 13x$

$$\frac{\sin 17 - \sin 5 + 2\cos 11}{2(1+\sin 6)} = \frac{2\cos 11\sin 6 + 2\cos 11}{2(1+\sin 6)} = \frac{\cos 11(\sin 6 + 1)}{1+\sin 6}$$

A

If $3\cos^2\theta + 4(\sin\theta - 1) = 0$ then find the value of $(\sec^2\theta + \tan^2\theta)$ =? $\theta \neq 90^\circ$

(a) $\frac{5}{4}$ (A)

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

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

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

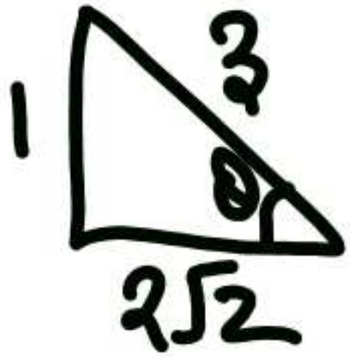
$3-3S^2+4S-4=0$

$3S^2-4S+1=0$

$3S^2-3S-S+1=0$

$3S(S-1)-1(S-1)=0$

$S=\frac{1}{3}$



$\frac{9}{8}+\frac{1}{8}$

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

The value of $\dfrac{\sin x + \sin 2x}{(1 + \cos x + \cos 2x)}$ is

(a) sinx (b) tanx

(c) cotx (d) $\sec^2 x$

$$\frac{S+2SC}{2C^2+C} = \frac{S(1+2C)}{C(2C+1)} = \tan x$$

(B)

If $\tan 69^\circ + \tan 66^\circ - \tan 66^\circ \tan 69^\circ = 2k$ the find the value of $k = ?$

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

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

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

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

$-1 = 2K$

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

$t(66+69)$

$-1 = \frac{t66 + t69}{1 - t66\,t69}$ → $t66\,t69(-1) = t66 + t69$ last ques