01. (i) $P(x) = (\lambda - 2)x^2 - 3(\lambda + 2)x + 6\lambda$

$\lambda = 2$ [illegible] $P(x) = -12x + 12$ [illegible]

$\lambda = 2$ [illegible] $x = 3$ [illegible] $P(3) = -24 < 0$

[illegible] $\lambda = 2$ [illegible] $x$ [illegible] $p(x)$ [illegible]

$\lambda \neq 2$ [illegible] $\lambda - 2 < 0$ [illegible] $x$ [illegible] $p(x)$ [illegible] $\lambda$ [illegible]

$\lambda - 2 > 0$ [illegible]

$\Delta_x = 9(\lambda + 2)^2 - 4(\lambda - 2)6\lambda < 0$ [illegible]

[illegible] $\forall x \in \mathbb{R}$ [illegible] $P(x) > 0$ [illegible]

[illegible] $\lambda \neq 2$ [illegible] $\Delta = 9(\lambda^2 + 4\lambda + 4)$
$- 24\lambda^2 + 48\lambda < 0$

[illegible] $\lambda > 2$ [illegible]

$-15\lambda^2 + 84\lambda + 36 < 0$

$\Rightarrow \lambda > 2$ [illegible] $5\lambda^2 - 28\lambda - 12 > 0$

$\Rightarrow \lambda > 2$ [illegible] $(5\lambda + 2)(\lambda - 6) > 0$

$\Rightarrow \lambda > 2$ [illegible] $\lambda < -\frac{2}{5}$ [illegible] $\lambda > 6$

$\Rightarrow \lambda > 6$

$\therefore$ $x$ [illegible] $P(x) > 0$ [illegible] $\lambda$ [illegible] $\lambda = 7$ [illegible]

(ii) $P(x)$ [illegible] $\lambda \neq 2$ [illegible] $\Delta > 0$ [illegible]

[illegible] $\lambda \neq 2$ [illegible] $(5\lambda + 2)(\lambda - 6) < 0$

$\Rightarrow \lambda \neq 2$ [illegible] $\frac{-2}{5} < \lambda < 6$

[illegible] $\lambda \in \left(\frac{-2}{5}, 2\right) \cup (2, 6)$

(iii) $P(x) = 0$ [illegible] $\alpha$ [illegible] $\beta$ [illegible] $\alpha > \beta$ [illegible]

[illegible] $\alpha + \beta = \frac{3(\lambda + 2)}{(\lambda - 2)}$ [illegible] $\alpha\beta = \frac{6\lambda}{\lambda - 2}$

[illegible]

$\alpha - \beta = 3$ [illegible]

$(\alpha - \beta)^2 = (\alpha + \beta)^2 - 4\alpha\beta$

$9 = \frac{9(\lambda + 2)^2}{(\lambda - 2)^2} - \frac{24\lambda}{\lambda - 2}$

$\Rightarrow 9(\lambda - 2)^2 = 9(\lambda + 2)^2 - 24\lambda(\lambda - 2)$

$\Rightarrow \cancel{9\lambda^2} - 36\lambda + \cancel{36}$

$= \cancel{9\lambda^2} + 36\lambda + \cancel{36} - 24\lambda^2 + 48\lambda$

$\Rightarrow 24\lambda^2 - 120\lambda = 0$

$\Rightarrow \lambda^2 - 5\lambda = 0$

$\Rightarrow \lambda(\lambda - 5) = 0$

$\therefore \lambda = 0$ [illegible] $\lambda = 5$

02. (a)

| [illegible] | [illegible] | |
|---|---|---|
| (a) 5, 1, 1, 1 | $\frac{8!}{5!(1!)^3 3!}$ | $= 56$ |
| (b) 4, 2, 1, 1 | $\frac{8!}{4!2!(1!)^2 2!}$ | $= 420$ |
| (c) 3, 3, 1, 1 | $\frac{8!}{(3!)^2(1!)^2 2!2!}$ | $= 280$ |
| (d) 3, 2, 2, 1 | $\frac{8!}{3!(2!)^2 1!2!}$ | $= 840$ |
| (e) 2, 2, 2, 2 | $\frac{8!}{(2!)^4 4!}$ | $= 105$ |

$\therefore$ [illegible]

$= 56 + 420 + 280 + 840 + 105$

$= \underline{\underline{1701}}$

(b) ${}^{n}C_{r+1} + {}^{n}C_{r}$

$= \frac{n!}{(n-r-1)!(r+1)!} + \frac{n!}{(n-r)!r!}$

$= \frac{n!(n-r)}{(n-r)!(r+1)!} + \frac{n!(r+1)}{(n-r)!(r+1)!}$

$= \frac{n!(n-r+r+1)}{(n-r)!(r+1)!}$

$= \frac{(n+1)!}{(n+1-r+1)!(r+1)!}$

$= {}^{n+1}C_{r+1}$

[illegible]

${}^{2003}C_r = \cancel{{}^{2004}C_{r+1}} - {}^{2003}C_{r+1}$

${}^{2004}C_r = \cancel{{}^{2005}C_{r+1}} - \cancel{{}^{2004}C_{r+1}}$

${}^{2005}C_r = \cancel{{}^{2006}C_{r+1}} - \cancel{{}^{2005}C_{r+1}}$

${}^{2013}C_r = {}^{2014}C_{r+1} - \cancel{{}^{2013}C_{r+1}}$

${}^{2003}C_r + {}^{2004}C_r + \dots {}^{2013}C_r$

$= \underline{{}^{2014}C_{r+1} - {}^{2003}C_{r+1}}$

03. (a) $P(n) : 8(n+1)! > 2^{n+1}(n+2)$ [illegible]

$n = 1$ [illegible]

L.H.S $= 8 \times 2!$ $= 16$

R.H.S $= 4 \times 3$ $= 12$

$\therefore P(1)$ [illegible]

$P(p)$ [illegible] $p \in \mathbb{Z}^+$ [illegible]

[illegible] $8(p+1)! > 2^{p+1}(P+2)$

[illegible] $(p+2)$ [illegible]

$8(P+1)!(P+2) > 2^{P+1}(P+2)^2$

$\Rightarrow 8(p+2)! > 2^{P+1}(p+2)^2$

$= 2^{P+1}(p^2+4p+4)$

$= 2^{P+1}[(2p+3)+(p+1)^2]$

$> 2^{P+1}(2p+3)+3]$

$\forall p \in \mathbb{Z}, (p+1)^2 > 3$

[illegible] $8(p+2)! > 2^{p+2}(p+3)$

$\Rightarrow 8(\overline{p+1}+1)! > 2^{\overline{p+1}+1}(\overline{p+1}+2)$

$\therefore P(p+1)$ [illegible]

[illegible] $n$ [illegible] $P(n)$ [illegible]

[illegible]

$\frac{(n+1)!}{2^{n+1}} > \frac{(n+2)}{8}$ [illegible] $n = 1, 2, 3 \ldots$

$\therefore \sum_{k=1}^{n} \frac{k!}{2^k}$

$= \frac{1}{2} + \sum_{k=1}^{n-1} \frac{(k+1)!}{2^{k+1}} > \frac{1}{2} + \sum_{k=1}^{n-1} \frac{(k+2)}{8}$

$= \frac{1}{2} + \frac{1}{8}\sum_{k=1}^{n-1}(k+2)$

$= \frac{1}{2} + \frac{1}{8}\left[\frac{(n-1)n}{2} + \frac{2(n-1)}{8}\right]$

$= \frac{1}{16}(n^2+3n+4)$

$S_n = \sum_{k=1}^{n} \frac{k!}{2^k} > \frac{1}{16}(n^2+3n+4); \ \forall n \in \mathbb{Z}^+$

$\lim_{n\to\infty} S_n > \lim_{n\to\infty} \frac{1}{16}(n^2+3n+4) = \infty$

$\Rightarrow \lim_{n\to\infty} S_n = \infty$

$\therefore$ [illegible]

(b) $x < -2$ [illegible]

$-(x+2) + [-(x-1)] > 5$

$= -x - 2 - x + 1 = -2x - 1 > 5$

$\Rightarrow x < -3$ [illegible] $x < -3$ [illegible]

$-2 \le x < 1$ [illegible]

$(x+2) + [-(x-1)] = x + 2 - x + 1 = 3 > 5$

[illegible] $\therefore -2 \le x < 1$ [illegible]

$1 \le x$ [illegible]

$(x+2) + (x-1) = 2x + 1 > 5$

$\Rightarrow x > 2$

[illegible] $x > 2$ [illegible]

$\therefore$ [illegible] $x$ [illegible]

$\{x \in \mathbb{R}: x < -3\} \cup \{x \in \mathbb{R}: x > 2\}$

[illegible] $x \in (-\infty, -3) \cup (2, \infty)$

04. $\omega = \sqrt{3} + i = 2\left(\frac{\sqrt{3}}{2} + \frac{1}{2}i\right)$

$= 2\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

$\omega^2 = \omega\omega$

$= 2^2\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

$= 4\left[\left(\cos^2\frac{\pi}{6} - \sin^2\frac{\pi}{6}\right) + i2\sin\frac{\pi}{6}\cos\frac{\pi}{6}\right]$

$= 4\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)$

$\omega^3 = \omega^2\omega$

$= 8\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

$= 8\left[\left(\cos\frac{\pi}{3}\cos\frac{\pi}{6} - \sin\frac{\pi}{3}\sin\frac{\pi}{6}\right) + i\left(\sin\frac{\pi}{3}\cos\frac{\pi}{6} + \cos\frac{\pi}{3}\sin\frac{\pi}{6}\right)\right]$

$= 8\left(\cos\frac{\pi}{2} + i\sin\frac{\pi}{2}\right)$

$\omega^4 = \omega^3\omega$

$= 16\left(\cos\frac{\pi}{2} + i\sin\frac{\pi}{2}\right)\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

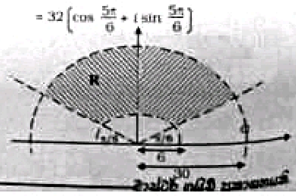
$= 16\left[\left(\cos\frac{\pi}{2}\cos\frac{\pi}{6} - \sin\frac{\pi}{2}\sin\frac{\pi}{6}\right) + i\left(\sin\frac{\pi}{2}\cos\frac{\pi}{6} + \cos\frac{\pi}{2}\sin\frac{\pi}{6}\right)\right]$

$= 16\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)$

$\omega^5 = \omega^4\omega$

$= 32\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

$= 32\left(\cos\frac{5\pi}{6} + i\sin\frac{5\pi}{6}\right)$








$|\omega| = 2 < 6$

$|\omega^2| = 4 < 6$ [illegible] $|\omega^5| = 32 > 30$

[illegible] $\omega$, $\omega^2$ [illegible] $\omega^5$ R [illegible]

$|\omega^3| = 8 \Rightarrow \arg(\omega^3) = \frac{\pi}{2}$ [illegible]

$|\omega^4| = 16 \Rightarrow \arg(\omega^4) = \frac{2\pi}{3}$

[illegible] $\omega^3$ [illegible] $\omega^4$ [illegible] R [illegible]

05. (a) $y = e^{\cos x}$

$\Rightarrow \frac{dy}{dx} = e^{\cos x}(-\sin x)$

$\left(\frac{dy}{dx}\right)_{x=0} = 0$

$\left(\frac{d^2y}{dx^2}\right) = e^{\cos x}(-\cos x) + (-\sin x)e^{\cos x}(-\sin x)$

$= -e^{\cos x}\cos x + \sin^2 x e^{\cos x}$

$\left(\frac{d^2y}{d^2x}\right)_{x=0} = -e$

$\frac{dy}{dx} = -y\sin x$

$\Rightarrow \frac{d^2y}{dx^2} = -\frac{dy}{dx}\sin x - y\cos x$

$\left(\frac{d^3y}{dx^3}\right) = -\frac{d^2y}{dx^2}\sin x - \frac{dy}{dx}\cos x - \frac{dy}{dx}\cos x + y\sin x$

$\left(\frac{d^3y}{dx^3}\right)_{x=0} = 0$

$\frac{d^3y}{dx^3} = -\left(\frac{d^2y}{dx^2}\right)\sin x - 2\frac{dy}{dx}\cos x - \frac{dy}{dx}$

$\frac{d^4y}{dx^4} = -\left(\frac{d^3y}{dx^3}\right)\sin x - \left(\frac{d^2y}{dx^2}\right)\cos x - 2\left(\frac{d^2y}{dx^2}\right)\cos x + 2\frac{dy}{dx}\sin x - \frac{d^2y}{dx^2}$

$\left(\frac{d^4y}{dx^4}\right)_{x=0} = 4e$

$\frac{d^4y}{dx^4} = -\left(\frac{d^3y}{dx^3}\right)\sin x - 3\left(\frac{d^2y}{dx^2}\right)\cos x - \frac{d^2y}{dx^2} + 2\frac{dy}{dx}\sin x$

$\frac{d^5y}{dx^5} = -\left(\frac{d^4y}{dx^4}\right)\sin x - \left(\frac{d^3y}{dx^3}\right)\cos x - 3\left(\frac{d^3y}{dx^3}\right)\cos x + 3\left(\frac{d^2y}{dx^2}\right)\sin x - \left(\frac{d^3y}{dx^3}\right) + 2\left(\frac{d^2y}{dx^2}\right)\sin x + 2\frac{dy}{dx}\cos x$

$= -\left(\frac{d^4y}{dx^4}\right)\sin x - 4\left(\frac{d^3y}{dx^3}\right)\cos x - \left(\frac{d^3y}{dx^3}\right) + 5\left(\frac{d^2y}{dx^2}\right)\sin x + 2\frac{dy}{dx}\cos x$

$\left(\frac{d^5y}{dx^5}\right)_{x=0} = 0$

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

$\Rightarrow \frac{dy}{dx} = \frac{(1+x^2)2 - 2x(2x)}{(1+x^2)^2}$

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

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

$\frac{dy}{dx} = 0 \Rightarrow x = \pm 1$

$x = 1$ [illegible] $y = 1$ [illegible]

$x = -1$ [illegible] $y = -1$

| [illegible] | $\frac{dy}{dx}$ | |
|---|---|---|
| $x < -1$ | (-) | [illegible] |
| $x = -1$ | 0 | |
| $-1 < x < 1$ | (+) | |
| $x = 1$ | 0 | [illegible] |
| $1 < x$ | (-) | |

$\therefore (-1, -1)$ [illegible]

$(1, 1)$ [illegible]

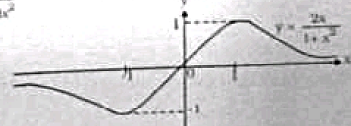
$x = 0$ [illegible] $y = 0$ [illegible]

$y = 0$ [illegible] $x = 0$ [illegible]

$y = \frac{2/x}{1/x^2 + 1}$

$x \to -\infty$ [illegible] $y \to 0^-$

$x \to \infty$ [illegible] $y \to 0^+$



06. (a) $\sqrt[3]{x} = y$ [illegible]

$x = y^3 \Rightarrow dx = 3y^2 dy$

$\therefore \int_1^8 \frac{dx}{1 + x^{1/3}}$

$= \int_1^2 \frac{3y^2 dy}{1 + y}$

$= 3\int_1^2 \left[(y - 1) + \frac{1}{1 + y}\right] dy$

$= 3\left[\frac{y^2}{2} - y + \ln|1 + y|\right]_1^2$

$= 3\left[\ln 3 - \frac{1}{2} + 1 - \ln 2\right]$

$= 3\left[\frac{1}{2} + \ln\frac{3}{2}\right]$

(b) $\int_0^1 x^2 e^{2x+3} dx$

$= e^3 \int_0^1 x^2 e^{2x} dx$

$= e^3 \int_0^1 x^2 \frac{d}{dx}\left(\frac{e^{2x}}{2}\right) dx$

$= e^3 \left[\left(x^2 \frac{e^{2x}}{2}\right)_0^1 - \int_0^1 \frac{e^{2x}}{2} 2x dx\right]$

$= e^3 \left[\frac{e^2}{2} - \int_0^1 x \frac{d}{dx}\left(\frac{e^{2x}}{2}\right) dx\right]$

$= e^3 \left[\frac{e^2}{2} - \left(x \frac{e^{2x}}{2}\right)_0^1 + \int_0^1 \frac{e^{2x}}{2} dx\right]$

$= e^3 \left[\frac{e^2}{2} - \frac{e^2}{2} + \left(\frac{e^{2x}}{4}\right)_0^1\right]$

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

(c) $\frac{1}{x(x^2+3)} = \frac{A}{x} + \frac{Bx + C}{x^2 + 3}$

$\Rightarrow A = \frac{1}{3}, \quad B = \frac{-1}{3}$ ස C = 0

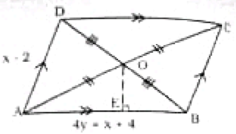
$\int \frac{dx}{x(x^2+3)} = \int \frac{dx}{3x} - \int \frac{x}{3(x^2+3)} dx$

$= \frac{1}{3}\left[\ln|x| - \frac{1}{2}\ln|x^2 + 3|\right] + D$

$= \frac{1}{3}\ln\frac{|x|}{\sqrt{x^2+3}} + D$

මෙහි D අභිමත නියතයකි.

07.




(i) $y = x - 2$ —— ①

$4y = x + 4$ —— ②

① හා ② න් $4(x - 2) = x + 4$

$\Rightarrow x = 4, y = 2$

$A \equiv (4, 2)$ එබැවින් $C \equiv (-4, -2)$

BC හි සමීකරණය $y = x + c$ ආකාර වේ.

(-4, -2) හරහා යන බැවින්

$-2 = -4 + C \Rightarrow C = 2$

$\therefore$ BC හි සමීකරණය $y = x + 2$

CD හි සමීකරණය $4y = x + d$ ආකාර වේ

C හරහා යන බැවින්

$4(-2) = -4 + d \Rightarrow d = -4$

$4y = x - 4$

(ii) AC හි සමීකරණය

$\frac{y - 0}{x - 0} = \frac{-2 - 2}{-4 - 4} = \frac{1}{2} \Rightarrow 2y = x$

B හරහා යන [illegible] සමීකරණය

$4y - x - 4 + \lambda(y - x - 2) = 0$

මෙහි $\lambda \in \mathbb{R}$ වේ

මෙය O හරහා යන විට $\lambda = -2$

$\therefore$ BD හි සමීකරණය

$4y - x - 4 - 2(y - x - 2) = 0$

$2y + x = 0$

AB ⇒ $4y = x + 4$ —— ③

BC ⇒ $y = x + 2$ —— ④

③ හා ④ විසඳීමෙන්

$B \equiv \left(\frac{-4}{3}, \frac{2}{3}\right)$

සමාන්තරාස්‍රයේ වර්ගඵලය

$= 4 \times$ AOB Δ [illegible]

$= 4 \times \frac{1}{2}$ AB.OE

$= 4 \times \frac{1}{2} \times \sqrt{\left(4 + \frac{4}{3}\right)^2 + \left(2 - \frac{2}{3}\right)^2} \times \frac{4}{\sqrt{17}}$



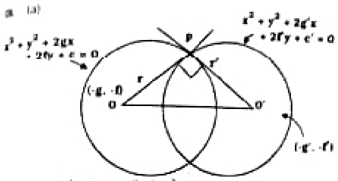


$= 2 \times \sqrt{\frac{256}{9} + \frac{16}{9}} \times \frac{4}{\sqrt{17}}$

$= 2 \times \frac{4}{\sqrt{17}} \times \frac{4\sqrt{17}}{3}$

$= \frac{32}{3}$ [illegible]

08. (a)




[illegible]

$(PO)^2 + (PO^1)^2 = (OO^1)^2$

[illegible] $(r)^2 + (r')^2 = (-g + g')^2 + (-f + f')^2$

මෙහි $r = \sqrt{g^2 + f^2 - c}$ හා

$r' = \sqrt{g'^2 + f'^2 - c'}$ වේ

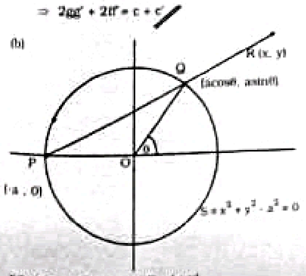
$(g^2 + f^2 - c) + (g'^2 + f'^2 - c')$

$= g^2 + g'^2 - 2gg' + f^2 + f'^2 - 2ff'$

$\Rightarrow -c - c' = -2gg' - 2ff'$

$\Rightarrow 2gg' + 2ff' = c + c'$

(b)




PQ : QR = 1:1 හා R ≡ (x, y)

$\Rightarrow \frac{-a + x}{2} = a\cos\theta$ හා $\frac{0 + y}{2} = a\sin\theta$

$\Rightarrow x = 2a\cos\theta + a,$

$y = 2a\sin\theta$

$\Rightarrow R \equiv (2a\cos\theta + a, 2a\sin\theta)$

එවිට $\cos\theta = \frac{x - a}{2a} \Rightarrow \sin\theta = \frac{y}{2a}$

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

$\Rightarrow \left(\frac{x - a}{2a}\right)^2 + \left(\frac{y}{2a}\right)^2 = 1$

$\Rightarrow (x - a)^2 + y^2 = 4a^2$

[illegible] R, අරය 2a හා කේන්ද්‍රය (a, 0) වූ S' [illegible]

S' හි සමීකරණය $x^2 + y^2 - 2ax - 3a^2 = 0$

S'' හි සමීකරණය

$S'' \equiv x^2 + y^2 + 2gx + 2fy + c = 0$ [illegible]

S හා S'' [illegible]

$2g(0) + 2f(0) = c - a^2 \Rightarrow c = a^2$

S' හා S'' [illegible]

$2g(-a) + 2f(0) = c - 3a^2$

$\Rightarrow -2ga = c - 3a^2$

$\Rightarrow -2ga = -2a^2 \Rightarrow g = a$

$\therefore S'' \equiv x^2 + y^2 + 2ax + 2fy + a^2 = 0$

S'', y [illegible] $x = 0$ [illegible] y [illegible]

එවිට $y^2 + 2fy + a^2 = 0$ හි [illegible]

එවිට $4f^2 - 4a^2 = 0 \Rightarrow f^2 = a^2 \Rightarrow f = \pm a$

[illegible] S''

[illegible]

$S'' \equiv x^2 + y^2 + 2ax + 2ay + a^2 = 0$ හා

$S'' \equiv x^2 + y^2 + 2ax - 2ay + a^2 = 0$ වේ.

09. (a) (i) $x = \sin\theta - \cos\theta$

$\Rightarrow x^2 = \sin^2\theta + \cos^2\theta - 2\sin\theta\cos\theta$

$= 1 - \sin 2\theta$

$\Rightarrow \sin 2\theta = 1 - x^2$

(ii) $y = \tan\theta + \cot\theta$

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

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

$= \frac{1}{\frac{1}{2}\sin 2\theta} = \frac{2}{\sin 2\theta}$

$\Rightarrow \sin 2\theta = \frac{2}{y}$

$\therefore 1 - x^2 = \frac{2}{y} \Rightarrow y(1 - x^2) - 2 = 0$

(b) $\sin 2x + \sin 4x + \sin 6x$

$= \sin 4x + (\sin 2x + \sin 6x)$

$= \sin 4x + 2\sin 4x \cos 2x$

$= (1 + 2\cos 2x) \sin 4x$

$\sin x (\sin 2x + \sin 4x + \sin 6x)$

$= \sin x (1 + 2\cos 2x) \sin 4x$

$= \sin 4x (\sin x + 2\sin x \cos 2x)$

$= \sin 4x (\sin x + \sin 3x - \sin x)$

$= \sin 3x \sin 4x$

$x = \frac{\pi}{12}$ ලෙස ගනිමු විට

$$\sin \frac{\pi}{12}\left(\frac{1}{2} + \frac{\sqrt{3}}{2} + 1\right) = \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2}$$

$$\left(\frac{3 + \sqrt{3}}{2}\right) \sin \frac{\pi}{12} = \frac{\sqrt{3}}{2\sqrt{2}}$$

$$\sin \frac{\pi}{12} = \frac{2\sqrt{3}}{2\sqrt{2}(3 + \sqrt{3})}$$

$$\sin \frac{\pi}{12} = \frac{\sqrt{3}(3 - \sqrt{3})}{\sqrt{2}(9 - 3)}$$

$$= \frac{3(\sqrt{3} - 1)}{6\sqrt{2}}$$

$$= \frac{\sqrt{6} - \sqrt{2}}{4}$$

සයින් සූත්‍රය :- ABC ඕනෑම ත්‍රිකෝණයක් සඳහා සම්මත අංකනය අනුව

$$\frac{\text{Sin } A}{a} = \frac{\text{Sin } B}{b} = \frac{\text{Sin } C}{c} \quad \text{වේ}$$

$$\frac{\text{Sin } A}{a} = \frac{\text{Sin } B}{b} = \frac{\text{Sin } C}{c} = k$$

ලෙස ගනිමු.

$a = b + \lambda c$ විට

$\Rightarrow \text{Sin } A = \text{Sin } B + \lambda \text{Sin } C$

$\Rightarrow \lambda \text{Sin } C = \text{Sin } A - \text{Sin } B$

$= \text{Sin } (B + C) - \text{Sin } B$

$(\because A + B + C = \pi)$

$$\Rightarrow 2\lambda \text{ Sin } \frac{C}{2} \cos \frac{C}{2}$$

$$= 2\text{Sin } \frac{C}{2} \cos \frac{(2B + C)}{2}$$

$$\Rightarrow \lambda \cos \frac{C}{2} = \cos\left(B + \frac{C}{2}\right)$$

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