

01)  $f(n) = n^3 + 11n$

$n=1$  ഒരു  $f(1) = 12$

$\therefore n=1$  ഒരു  $f(n)$  അംഗം 6 ക്കാണ്  
വരുപ്പത്വം. (5)

$n=p$  ഒരു  $f(n)$  അംഗം 6 ക്കാണ്  
വരുപ്പത്വം എൻ.  $p \in \mathbb{Z}^+$ .

$p^3 + 11p = 6k$  (5)

$n=p+1$  ഒരു  $f(p+1) = (p+1)^3 + 11(p+1)$

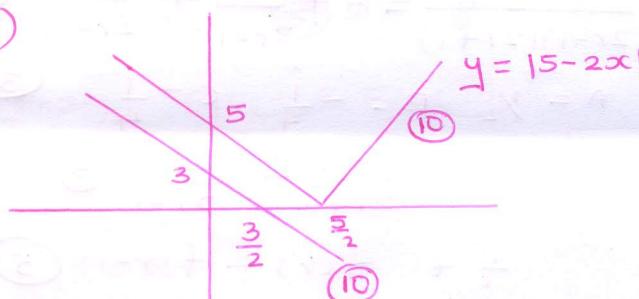
$$\Rightarrow = 6(k+2) + 3p$$

$$= 6(k+2+p)$$

(അംഗം) (5)

[25]

02)

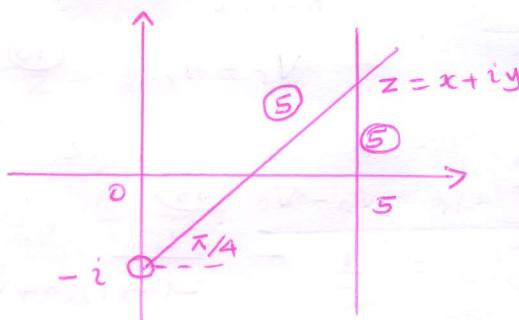


കൂടുതൽ  $x$  ക്കാണ് എസ്സെപ്പ് ബഹുമാനിക്കു  
ന്നതുകൊണ്ട് 2 മുത്തൊന്തുമധ്യാത്മ. (5)

[25]

03)  $z = x + iy$

$$\Rightarrow x = 5 \quad (5)$$



$$x = 5, y = 4 \quad (5)$$

$$z = 5 + 4i \quad (5)$$

[25]

04) (5)  $\frac{8!}{2!} = 20160$  (5)

(5)  $7! = 5040$  (5)

720 (5)

[25]

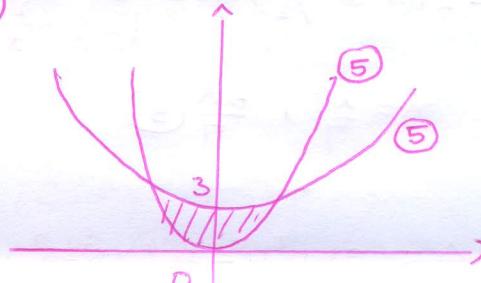
05)  $\lim_{x \rightarrow 0} \frac{(1-\cos x)(1+\cos x + \cos^2 x)(\sqrt{x^2+9}+3)}{x^2}$  (10)

$$= \left( \lim_{x \rightarrow 0} \frac{\sin x}{x} \right)^2 \lim_{x \rightarrow 0} \frac{(1+\cos x + \cos^2 x)(\sqrt{x^2+9}+3)}{(1+\cos x)}$$

$$= 1^2 \cdot \frac{3 \cdot 6}{2} = 9 \quad (5)$$

[25]

06)



$$A = \int_{-1}^1 (2x^2 + 3) dx - \int_{-1}^1 5x^2 dx \quad (5)$$

$$= 3 \left[ x - \frac{x^3}{3} \right]_{-1}^1 \quad (5)$$

$$= 4 \quad (5)$$

[25]

07)  $x^2 + xy + y^2 = k \quad \text{--- (1)}$

$$2x + x \frac{dy}{dx} + y + 2y \frac{dy}{dx} = 0 \quad (10)$$

$$\frac{dy}{dx} = -\frac{(2x+y)}{x+2y} \quad (5)$$

$$y = -2x \quad (5)$$

$$\text{--- (2)} \quad 3y^2 = k \quad (5)$$

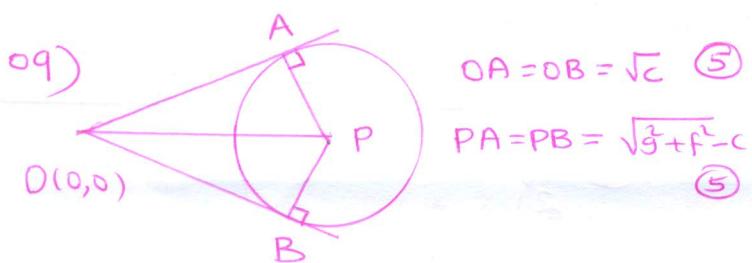
[25]

08)  $2x + 3y - 5 + k(3x - 4y - 3) = 0$  (10)

$$\Rightarrow k = -\frac{5}{3} \quad (5)$$

$$\therefore \text{സംവാദം } 9x - 29y = 0 \quad (10)$$

[25]



$$OA = OB = \sqrt{c} \quad (5)$$

$$PA = PB = \sqrt{g^2 + f^2 - c} \quad (5)$$

$$\text{Area of } \triangle OAP = 2 \times \frac{1}{2} \times OA \times AP \quad (5)$$

$$= 2 \times \frac{1}{2} \times \sqrt{c} \times \sqrt{g^2 + f^2 - c} \quad (5) \quad [25]$$

$$10) 2 \cos \frac{5\pi}{2} \cos \frac{\pi}{2} = 2 \sin \pi \cos \frac{\pi}{2} \quad (5)$$

$$\cos \frac{\pi}{2} = 0 \quad \text{or} \quad \cos \frac{5\pi}{2} = \sin \pi \quad (5)$$

$$\cos \frac{\pi}{2} = \cos \frac{\pi}{2} \quad \text{or} \quad \cos \frac{5\pi}{2} = \cos(\frac{\pi}{2} - \pi) \quad (5)$$

$$\frac{\pi}{2} = 2n\pi \pm \frac{\pi}{2}, n \in \mathbb{Z} \quad \text{or} \quad \frac{5\pi}{2} = 2n\pi \pm (\frac{\pi}{2} - \pi) \quad (5)$$

$$\pi = \frac{\pi}{2}, \frac{5\pi}{2} \quad (5)$$

[25]

$$11) a) \Delta_1 = 36a^2b^2 - 4(2b^2-a^2)2(a^2+b^2) < 0 \quad (10)$$

$$(=) 4(2a^4 + 7a^2b^2 - 4b^4) < 0 \quad (5)$$

$$(=) 4(2a^2 - b^2)(a^2 + 4b^2) < 0 \quad (5)$$

$$(=) 2a^2 - b^2 < 0 \quad (5)$$

$$(=) \Delta_2 = 4(b^2 - 2a^2) > 0 \quad (10)$$

$$(=) a^2 + 2ab + 2a = 0 \quad \text{由此}$$

从上式得  $a = -2b$  或  $b = -\frac{1}{2}a$   $\therefore$   $\alpha + \beta = -\frac{2b}{a} = 2$   $\therefore$   $\alpha\beta = 2$

[50]

$$\alpha(\alpha+1) + \beta(\beta+1) = (\alpha+\beta)^2 - 2\alpha\beta + (\alpha+\beta) \quad (5)$$

$$= \frac{1}{a^2} (4b^2 - 2ab - 4a) \quad (5)$$

$$\alpha(\alpha+1)\beta(\beta+1) = \alpha\beta(\alpha\beta + (\alpha+\beta) + 1) \quad (5)$$

$$= \frac{2}{a} (3a - 2b) \quad (5)$$

in ပုဂ္ဂနယ်

$$x^2 - \frac{1}{a^2} (4b^2 - 2ab - 4a)n + \frac{2}{a} (3a - 2b) = 0 \quad (5) \quad [35]$$

$$b) f(2) = 1 \Rightarrow 8a + 2b + c = 1 \quad (5)$$

$$f(-1) = 2 \Rightarrow -a - b + c = 2 \quad (5)$$

$$f(-3) = -4 \Rightarrow -27a - 3b + c = -4 \quad (5)$$

$$a = \frac{1}{3}, b = -\frac{4}{3}, c = 1 \quad (15)$$

$$f(m) = 0 \Rightarrow \\ m^3 - 4m + 3 = 0 \quad (5)$$

$$(m-1)(m^2+m+3) = 0 \quad (5)$$

$$m = 1 \quad \text{or} \quad m = -\frac{1 \pm \sqrt{13}}{2} \quad (5)$$

[65]

$$12) u_r = \frac{2r^2 - 1}{(2r-1)(2r+1)} \quad (5)$$

$$\frac{2r^2 - 1}{(2r-1)(2r+1)} = A + \frac{B}{2r-1} + \frac{C}{2r+1} \quad (15)$$

$$A = \frac{1}{2}, B = -\frac{1}{4}, C = \frac{1}{4} \quad (30)$$

$$u_r = \frac{1}{2} + \frac{1}{2r+1} - \frac{1}{2r-1} \quad (5) \quad [55]$$

$$\therefore \frac{1}{2} + f(r) - f(r-1) \quad (5)$$

$$\Rightarrow \sum_{r=1}^n u_r = \frac{1}{2} n + f(n) - f(0) \quad (15)$$

$$= \frac{1}{4} \left[ 2n-1 + \frac{1}{2n+1} \right] \quad (10) \quad [30]$$

$$\lim_{n \rightarrow \infty} = \infty \quad (5) \quad \text{ကြောင်းသိရှိ} \quad (5) \quad [10]$$

$$b) u_r = \frac{1}{n-r+2} \left[ \frac{1}{n-r+1} - \frac{1}{n-r+3} \right] \quad (10)$$

$$= v_r - v_{r-1} \quad (10) \quad v_r = \frac{1}{2(n-r+1)(n-r+2)} \quad (5)$$

$$\sum_{r=1}^n u_r = v_n - v_0 \quad (15)$$

$$= \frac{1}{4} - \frac{1}{2(n+1)(n+2)} \quad (5)$$

$$\sum_{r=1}^n \frac{1}{r(r+1)(r+2)} = \frac{1}{4} - \frac{1}{2(2n+1)(2n+2)} \quad (10)$$

$$13) A^2 = \begin{pmatrix} 8 & 5 \\ -5 & 3 \end{pmatrix} \quad (5)$$

$$A^2 - 5A = \begin{pmatrix} -7 & 0 \\ 0 & -7 \end{pmatrix} \quad (10)$$

$$= -7I \quad (5)$$

20

$$A^3 = A(5A - 7I) \quad (5)$$

$$= 5(5A - 7I) - 7A \quad (10)$$

$$35I = A(18I - A^2) \quad (10)$$

$$(18I - A^2)^{-1} = \frac{1}{35}A \quad (10)$$

35

$$b) \left| \frac{z_1 - z_3}{z_2 - z_3} \right| = \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2} \quad (10)$$

$$\left| \frac{z_1 - z_3}{z_2 - z_3} \right| = 1 \quad (5)$$

$$P_1 P_3 = P_1 B_3 \quad (5)$$

$$\text{கீழ்க்கண்ட } P_1 P_2 = P_2 P_3 \quad (15)$$

∴ தடுப்பது  $\Delta$  40

$$c) z = x + iy$$

$$w = \frac{2(1-i)}{2} + \frac{10z(3-i)}{10} \quad (10)$$

$$= (1+3x+y) + i(3y-x-1) \quad (10)$$

$$\Rightarrow 3y = x \quad (10)$$

$$|z(3-i)| = 10 \quad (5)$$

$$x^2 + y^2 = 10 \quad (10)$$

$$\Rightarrow x = 3, -3 \quad (10)$$

$$z = \pm (3+i)$$

55

$$14) a) f'(x) = \frac{(x^2 - 1)2(x-4) - (x-4)^2 \cdot 2}{(x^2 - 1)^2} \quad (10)$$

$$f'(x) = 0 \Rightarrow x = \frac{1}{4} > 4 \quad (10)$$

$$x = 1, x = -1 \quad 5 \cdot 3 = 15 \quad (5)$$

$$x < -1 \quad -1 < x < \frac{1}{4} \quad \frac{1}{4} < x < 1$$

+ +

- +

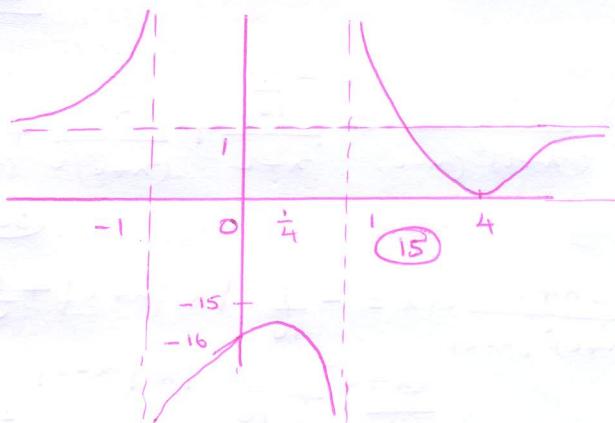
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$$-4 \left( \frac{1}{4}, -15 \right) \quad (5)$$

$$8 \cdot 4 (4, 0) \quad (5)$$

$$(0, -16), (4, 0) \quad (10)$$

$$x \rightarrow \pm\infty \quad f(x) \rightarrow 1 \quad (5)$$



b)

$$y = (b^2 + n^2) + (a-n)$$

$$+ b^2 \quad (10)$$

$$\frac{dy}{dn} = 4(n - \frac{a}{2}) \quad (15)$$

$$\frac{dy}{dn} = 0 \Rightarrow n = \frac{a}{2} \quad (10)$$

$$0 < n < \frac{a}{2} \quad \frac{a}{2} < n < a$$

$$n = \frac{a}{2} \text{ எனில் } y \text{ சமிக்கப்படும்} \quad (5)$$

60

$$15) a) \frac{dt}{d\theta} = \frac{1+t^2}{2} \quad (5) \quad t : 0 \rightarrow 1 \quad (5)$$

$$I = \int_0^1 \frac{1}{4-t^2} dt \quad (10)$$

$$= \int_0^1 \left( \frac{\frac{1}{4}}{2-t} + \frac{\frac{1}{4}}{2+t} \right) dt \quad (5)$$

$$= \frac{1}{4} \left[ \ln \left| \frac{t+2}{t-2} \right| \right]_0^1 \quad (10)$$

$$= \frac{1}{4} \ln 3 \quad (5)$$

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$$\frac{dp}{d\theta} = \frac{16}{(3+5 \cos \theta)^2} + \frac{3}{(3+5 \cos \theta)} \quad (20)$$

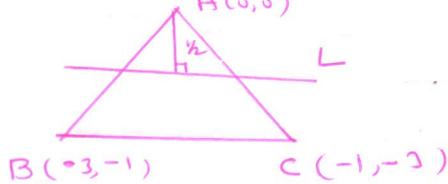
$$16 \int_0^{\frac{\pi}{2}} \frac{1}{(3+5 \cos \theta)^2} d\theta + 3 \int_0^{\frac{\pi}{2}} \frac{1}{3+5 \cos \theta} d\theta \\ = \left( \frac{5 \sin \theta}{3+5 \cos \theta} \right) \Big|_0^{\frac{\pi}{2}} \\ \int_0^{\frac{\pi}{2}} \frac{1}{(3+5 \cos \theta)^2} d\theta = \frac{5}{48} - \frac{3}{64} \ln 3 \quad (40) \quad \boxed{35}$$

$$b) \frac{3n+1}{(n+2)^2(n-2)} = \frac{-\frac{7}{16}}{n+2} + \frac{\frac{5}{4}}{(n+2)^2} + \frac{\frac{7}{16}}{n-2} \quad (30)$$

$$\int \frac{3n+1}{(n+2)^2(n-2)} dn = -\frac{7}{16} \ln |n+2| + \frac{5}{4} \cdot \frac{6n+1}{-1} + \frac{7}{16} \ln |n-2| + k \quad (20) \quad \boxed{50}$$

$$c) x^2(-\cos n) - (-\cos n) 2ndm \quad (10) \\ = -n^2 \cos n + 2n \sin n + 2 \cos n + c \quad (15) \quad \boxed{25}$$

16) a) ඔස්කර්තත්ත්වය (20) 20



$$L: x+y-c=0 \quad (15)$$

$$c = \pm \frac{1}{\sqrt{2}} \quad (10)$$

$$L: x+y+\frac{1}{\sqrt{2}}=0 \quad (5) \quad \boxed{40}$$

b) තිශ්චානී (30) 30

$$x^2 + y^2 - 5x - 6y - 4 + k(n^2 + y^2 - 2nx + 1) \quad (10)$$

$$\Rightarrow 5(1+k)x^2 + 5(2k-1)x + 5(2k-1) = 0 \quad (15) \quad \boxed{35}$$

$$\Delta=0 \quad (10)$$

$$\Rightarrow k = \frac{1}{2} \rightarrow -\frac{5}{2} \quad (10)$$

සුදුසායුම් :  $x^2 + y^2 - 4x - 2y + 3 = 0$   
 $x^2 + y^2 + 4y - 1 = 0 \quad (5)$  60

$$17) a) \cos \alpha = \frac{9}{5} \quad (5)$$

$$\Rightarrow \tan(\frac{\pi}{4} + \frac{\alpha}{2}) + \tan(\frac{\pi}{4} - \frac{\alpha}{2}) \quad (5)$$

$$= \frac{1 + \tan \frac{\alpha}{2}}{1 - \tan \frac{\alpha}{2}} + \frac{1 - \tan \frac{\alpha}{2}}{1 + \tan \frac{\alpha}{2}} \quad (15)$$

$$= \frac{2}{\cos \alpha} \quad (10) \quad = \frac{25}{9} \quad (5) \quad \boxed{40}$$

$$b) \sin 2A + \sin 2B + \sin 2C$$

$$= 2 \sin(A+B)(A-B) + 2 \sin C(A+C) \quad (5)$$

$$= 2 \sin C [ (A+B) - (A+C) ] \quad (10)$$

$$= 4 \sin A \sin B \sin C \quad (5)$$

$$\sin A = x, \sin B = y, \sin C = z \quad (5)$$

$$\sin 2A + \sin 2B + \sin 2C = 4 \sin A \sin B \sin C \quad (5)$$

$$\Rightarrow n\sqrt{1-n^2} + 4\sqrt{1-n^2} + 2\sqrt{1-n^2} = 2nyc \quad (5) \quad \boxed{35}$$

c) නිංෘදි (25) 25

$$(i) \frac{c-a}{c+a} = \frac{\sin C - \sin A}{\sin C + \sin A} \quad (5)$$

$$= \frac{\tan(\frac{C-A}{2})}{\tan(\frac{C+A}{2})} \quad (15) \quad \boxed{20}$$

$$(ii) \frac{\sin 3c}{b} = \frac{\sin c}{c} \quad (5)$$

$$3 - 4 \sin^2 c = \frac{b}{c} \quad (10)$$

$$\cos c = \sqrt{\frac{b+c}{4c}} \quad (5)$$

$$\sin \frac{A}{2} = \cos 2c \quad (5)$$

$$= 2 \left( \frac{b+c}{4c} \right) - 1 \quad (5)$$

$$= \frac{b-c}{2c} \quad (5) \quad \boxed{35}$$

## குறைந்த நலமிடம் - II

$$06) (a+b+c) \cdot (a+b+c) = 0 \quad (5)$$

$$a^2 + b^2 + c^2 + 2(a \cdot b + b \cdot c + c \cdot a) \\ 9^2 + 12^2 + 15^2 + 2(a \cdot b + b \cdot c + c \cdot a) \quad (5)$$

$$a \cdot b + b \cdot c + c \cdot a = -225 \quad (5)$$

02)

$$\sin \theta = \frac{\sqrt{3}w}{3b} \quad (5)$$

07)

$$\begin{aligned}
 03) \quad t &= \sqrt{\frac{2h}{g}} \quad (5) \\
 v &= \sqrt{2gh} \quad (5) \\
 h_1 &= e^2 h \quad (5) \\
 s &= h + 2(e^2 h + e^4 h + \dots) \quad (5) \\
 &= \left( \frac{1+e^2}{1-e^2} \right) h \quad (5)
 \end{aligned}$$

08) 
 A free body diagram of a horizontal beam. The left end is a roller support, and the right end is a fixed support. A downward force  $w$  is applied at the center of the beam. At the left roller, there is a reaction force  $T$  pointing down-left and an angle  $\theta$  between the reaction force and the horizontal. At the right fixed support, there is a reaction force  $T$  pointing up-right and an angle  $\theta$  between the reaction force and the horizontal. The distance from the left roller to the center is labeled  $\frac{l-c}{2}$ . The distance from the center to the right fixed support is also  $\frac{l-c}{2}$ .

Diagram showing a free body diagram of a 6000g mass on a 30° incline. A force  $F$  acts up the incline, and a reaction force  $R$  acts perpendicular to the incline. The weight  $6000g$  acts vertically downwards. A normal force  $N$  acts perpendicular to the incline.

$$\text{கிள்கிளின் புக்காப்பீடு} \frac{\omega}{\sin 2\theta} = \frac{T}{\cos \theta} \quad (5)$$

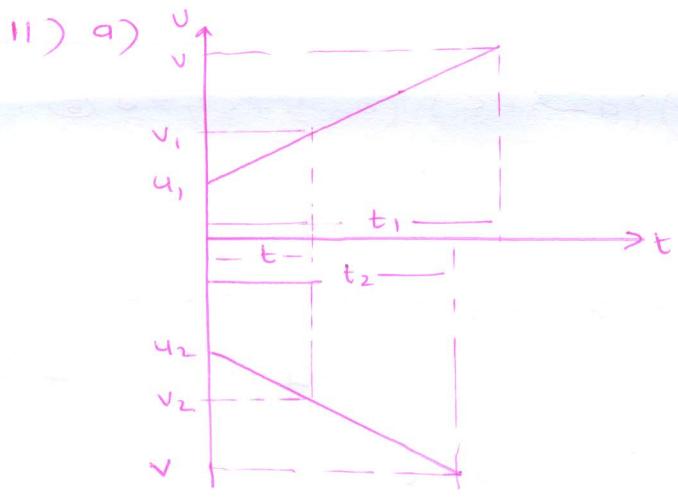
முறை நிறைவேலையின் வழங்கும் தகுதி =  $2T \cos \theta / l$  (5)

$$= W \left( \frac{l-c}{2(l-2c)} \right)^{\frac{1}{2}}$$

05)

(5) ⑤

$$= 1 - \frac{4}{10} \cdot \frac{3}{9} \cdot \frac{2}{8} \quad (10)$$



$$\frac{v_1 - u_1}{t} = f_1 \quad (5) \quad \frac{v_2 - u_2}{t} = f_2 \quad (5)$$

$$\left( \frac{v_1 + u_1}{2} \right) t = \left( \frac{v_2 + u_2}{2} \right) t = \frac{s}{2} \quad (5)$$

$$\therefore v_1 + u_1 = v_2 + u_2 \quad (5)$$

$$\Rightarrow t = \frac{2(u_2 - u_1)}{(f_1 - f_2)} \quad (10)$$

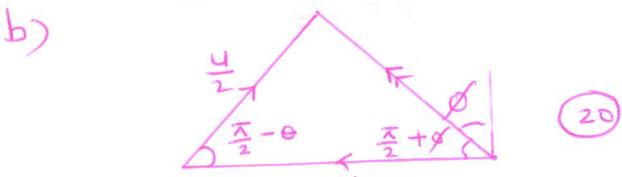
$$\frac{v - u_1}{t_1} = f_1 \quad (5) \quad \frac{v - u_2}{t_2} = f_2 \quad (5)$$

$$\Rightarrow s(f_1 - f_2) = \frac{u_2^2 - u_1^2}{2} \quad (5)$$

$$s = \frac{[(u_1 + u_2) + (v_1 + v_2)]}{2} t \quad (5)$$

$$\frac{u_2^2 - u_1^2}{f_1 - f_2} = \left[ \frac{2(u_1 + u_2) + 2(f_1 + f_2)}{\frac{u_2 - u_1}{f_1 - f_2}} \right]_2 \frac{(u_2 - u_1)}{f_1 - f_2} \quad (5)$$

$$\Rightarrow (f_1 - f_2)(u_2 + u_1) = 8(f_1 u_2 - f_2 u_1) \quad (10)$$



$$\frac{u_2}{\cos \phi} = \frac{u}{\sin(\pi - (\theta + \phi))} \quad (10)$$

$$\tan \phi = \frac{2 - \sin \theta}{\cos \theta} \quad (5)$$

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$$\tan \phi = k \text{ orios.}$$

$$(2+k) \tan^2 \frac{\theta}{2} - 2 \tan \frac{\theta}{2} + 2 - k = 0 \quad (10)$$

$$\Delta \geq 0$$

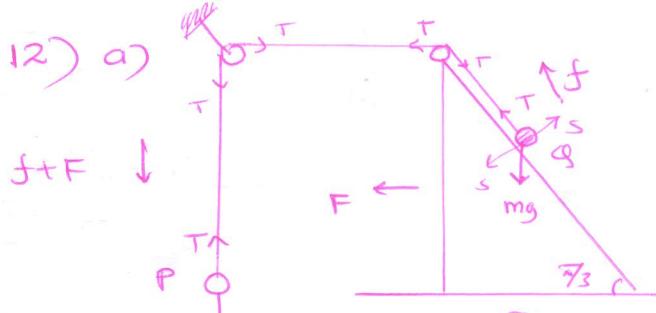
$$\phi_{\text{asymp}} = \frac{\pi}{3} \quad (10)$$

$$l_{\text{asymp}} = d \sin \frac{\pi}{3} \quad (5)$$

$$= \frac{d\sqrt{3}}{2} \quad (5)$$

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10



analog - 10  
analog - 15

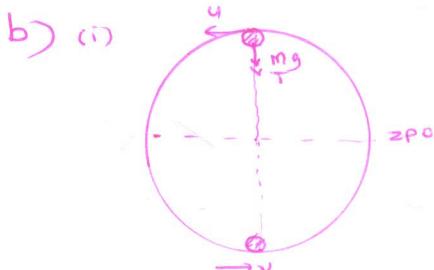
$$mg - T = m(f + F) \quad (10)$$

$$T - mg \cdot \frac{\sqrt{3}}{2} = m(f + F \cdot \gamma) \quad (10)$$

$$T = MF + m(F + f \cdot \gamma) \quad (15)$$

$$\Rightarrow F = \frac{mg(2+3\sqrt{3})}{8M+7m} \quad (15)$$

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$$T + mg = \frac{mv^2}{r} \quad (5)$$

$$T \geq 0 \quad (5)$$

$$v^2 - ag \geq 0 \quad (5)$$

$$4ag = \sqrt{ag} \quad (15)$$

$$(ii) \quad mg a + \frac{1}{2} m \ddot{v} = -mg a + \frac{1}{2} m \ddot{v} \quad (10)$$

$$\ddot{v} = \sqrt{5ag} \quad (5)$$

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$$(iii) \quad m \ddot{v} = \frac{5}{4} m \dot{v}^2 \Rightarrow \dot{v}^2 = \frac{4}{5} v \quad (5)$$

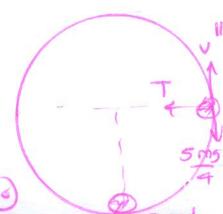
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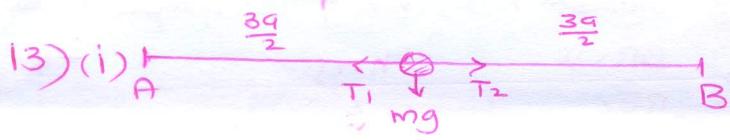
$$-\frac{5mg}{4} a + \frac{1}{2} \times \frac{5m}{4} \dot{v}^2 = \frac{1}{2} \times \frac{5m}{4} \dot{v}''^2 \quad (10)$$

$$\dot{v}''^2 = \frac{1}{2} \times \frac{16}{25} \times 5ag - ag \quad (10)$$

$$= \frac{3ag}{5} \quad (5)$$

$$T = \frac{3mg}{4} \quad (10)$$





$$T_1 = T_2 \quad (5)$$

$$\frac{mg(\frac{3a}{2} - a)}{a} = \frac{2mg(\frac{3a}{2} - ka)}{ka} \quad (10)$$

$$k = \frac{6}{5} \quad (10)$$

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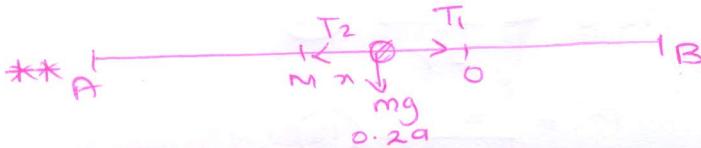


$$AO = \frac{3a}{2} + 0.2a > a \quad (5)$$

$$BO > \frac{6}{5}a \quad (5)$$

தாங்க வேண்டும் திறக்கவேண்டும் திறக்கும் (5)

15



$$T_1 - T_2 = m\ddot{x} \quad (10)$$

$$\frac{2mg(\frac{3a}{2} - x - ka)}{ka} - \frac{mg(\frac{3a}{2} + x - a)}{a} = m\ddot{x} \quad (10)$$

$$\Rightarrow \ddot{x} = -\frac{8g}{3a}x \quad (15)$$

35

$$(iii) 2\dot{x}\ddot{x} = -2\omega^2 x\ddot{x} \quad (10)$$

$$\ddot{x} = -\omega^2 x \quad (5)$$

$$\omega = \sqrt{\frac{8g}{3a}} \quad (5)$$

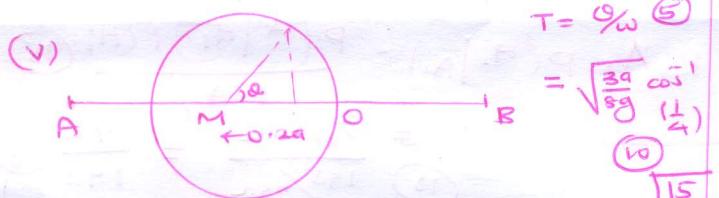
$$x = 0.2a, \ddot{x} = 0 \quad (10) \quad A = 0.2a \quad (5)$$

35

$$(iv) D \cdot \pi^2 = \frac{8g}{3a} ((0.2a)^2 - (0.05a)^2) \quad (10)$$

$$\Rightarrow a = \frac{1}{2} \quad (15)$$

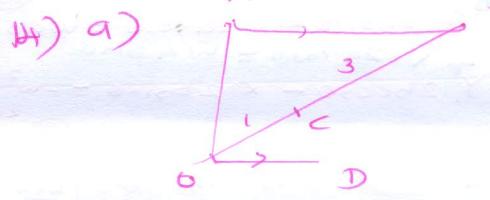
25



$$T = \frac{F}{\omega} \quad (5)$$

$$= \sqrt{\frac{3g}{8g} \cos^2(\frac{1}{4})} \quad (10)$$

15



$$i) \vec{OC} = \vec{OA} + \vec{AC} = -a + \frac{1}{4}b \quad (5) \quad \vec{AD} = \vec{AO} + \vec{OD} = \frac{4}{3}(-\frac{1}{4}a + \frac{1}{4}b) = \frac{4}{3}\vec{AC} \quad (5)$$

A, C, D என்னையுள்ளது (5)

30

$$ii) \vec{AP} = \lambda(b-a) \quad (5) \quad \vec{OG} = \mu(\frac{b-a}{3}) \quad (5)$$

$$\vec{PC} = \vec{PA} + \vec{AC} \quad (5)$$

$$= (\lambda-1)a + (\frac{1}{4}-\lambda)b \quad (5)$$

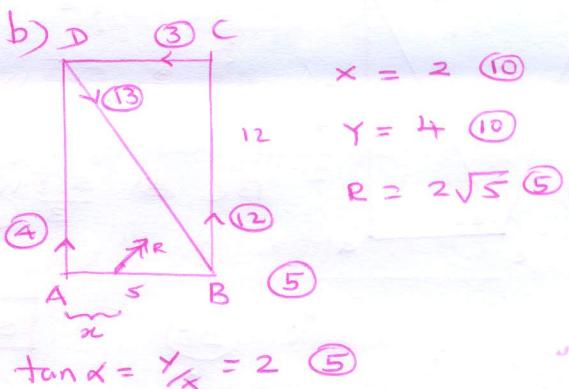
$$\vec{CG} = \vec{CO} + \vec{OG} \quad (5)$$

$$= -\frac{4}{3}a + (M_3 - \frac{1}{4})b \quad (5)$$

P, C, G என்னையுள்ளது (5)

$$\frac{\lambda-1}{-M_3} = \frac{\frac{1}{4}-\lambda}{M_3-\frac{1}{4}} \Rightarrow \lambda + \mu = 1 \quad (5)$$

45



$$x = 2 \quad (10)$$

$$Y = 4 \quad (10)$$

$$R = 2\sqrt{5} \quad (5)$$

30

$$\tan \alpha = \frac{Y}{X} = 2 \quad (5)$$

105

$$D) 4 \cdot x + 2 \cdot 12 = 5 \cdot 12 \Rightarrow x = 9 \quad (5)$$

பில்லை AB மீறு பொருத்த நீண்ட பகுதி (5)

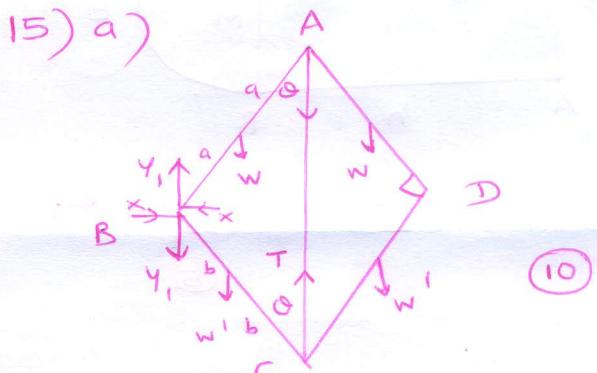
20

$$R \text{ at } E = R \text{ at } D + r \quad (5)$$

$$r) = 4 \cdot 9 + 2 \cdot 12 \quad (10)$$

$$= 60 \text{ Ncm} \quad (5)$$

20



10

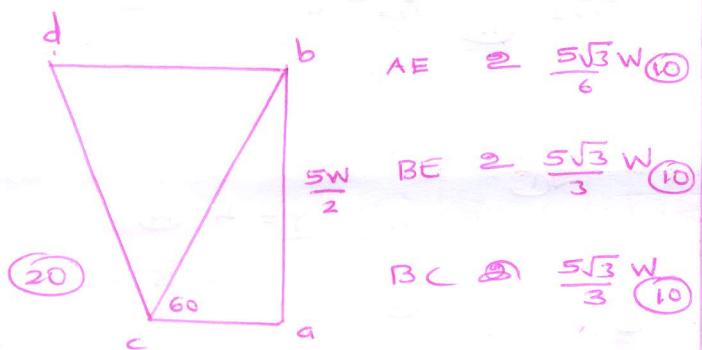
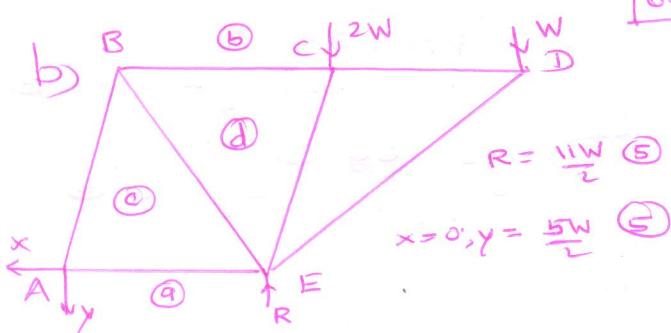
A) AB,  $\gamma_1 2a \sin\theta + x 2a \cos\theta = w \sin\theta$  (15)

C)  $\gamma_1 2b \cos\theta - x 2b \sin\theta = -w^2 b \cos\theta$  (15)

$$x = \frac{(w+w')}{2} \sin\theta \cos\theta \quad \gamma_1 = \left(\frac{w+w'}{2}\right) \sin^2\theta - \frac{w}{2}$$

D) BCD,  $T \cdot 2b \cos\theta = \gamma_1 4b \cos\theta + w'$   
 $3b \cos\theta + w' b \cos\theta$  (10)

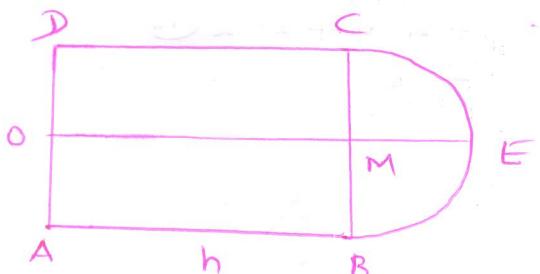
$$\Rightarrow T = (w+w') \sin^2\theta + w' \quad (5)$$



நிய தொல்பு எண்ணி

## 16) Theory

உய்த்தற்கள்



சமச்சீர்ணப்படி நிறைவேற்ற வடிவை கிடக்கும்.

பொருளி	தீவிரி	நிலை முறை
ABC	$h^2 r g$	$-h$ (10)
BEC	$\pi (2r)^2 g$	$\frac{8\pi}{3} \pi$ (10)
DE ஏங்	$(4\pi r^2 + 2hr)g$	$\pi$ (5)

$$(4\pi r^2 + 2hr)g \bar{x} = \pi (2r)^2 g \cdot \frac{8r}{3\pi} + h \cdot 2rg (-\frac{h}{2}) \quad (10)$$

$$\bar{x} = \frac{32r^3 - 3h^2}{6(2\pi r + h)} \quad (5) \quad [45]$$

$$h = 2r \text{ என்க}$$

$$\bar{x} = \frac{32r^2 - 3(2r)^2}{6(2\pi r + 2r) 2r} \quad (10)$$

$$= \frac{5r}{3(\pi + 1)} \quad (5)$$

$$\tan\theta < \frac{\bar{x}}{2r} \quad (10)$$

$$= \frac{5}{6(\pi + 1)} \quad (10)$$

$$\Omega_{max} = \tan^{-1} \left( \frac{5}{6(\pi + 1)} \right) \quad (10) \quad [55]$$

17) 8தற்படி எடுத்த நிறை

$$P(H) = \frac{1}{2} \quad (5)$$

$$P(T) = \frac{1}{2} \quad (5)$$

$$P(A|H) = \frac{b}{3b} + \frac{5}{3b} \quad (10)$$

$$= \frac{11}{36} \quad (5)$$

$$P(A|T) = \frac{2}{11} \quad (10)$$

$$P(A) = P(H) \cdot P(A|H) + P(T) \cdot P(A|T) \quad (20)$$

$$= \frac{1}{2} \cdot \frac{11}{36} + \frac{1}{2} \cdot \frac{2}{11} \quad (10)$$

$$= \frac{193}{792} \quad (10) \quad [75]$$

$$P(H_1|A) = \frac{P(A|H_1)P(H_1)}{P(A)} \quad (15)$$

$$= \frac{\frac{2}{11} \cdot \frac{1}{2}}{\frac{193}{792}} = \frac{72}{193} \quad (10) \quad [35]$$