ข้อ 2

หาจุดสูงสุดสัมพัทธ์

$f(x) = 3x^4 - 2x^3 - 6x^2 + 6x + 1$

$f' = 12x^3 - 6x^2 - 12x + 6$

$= 6x^2(2x-1) - 6(2x-1)$

$= 6(2x-1)(x^2-1)$

$= 6(2x-1)(x-1)(x+1)$

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

$f'' = 36x^2 - 12x - 12$

$f''(\frac{1}{2}) = 36(\frac{1}{2})^2 - 12(\frac{1}{2}) - 12$

$= 9 - 6 - 12 = -9$

$f''(1) = 36 - 12 - 12 = 12$

$f''(-1) = 36 + 12 - 12 = 36$

$\therefore x = \frac{1}{2}$ เป็นจุดสูงสุดสัมพัทธ์

$x = -1$ เป็นจุดต่ำสุดสัมพัทธ์

$f(\frac{1}{2}) = \frac{3}{16} - \frac{2}{8} - 6(\frac{1}{4}) + 6(\frac{1}{2}) + 1$

$= \frac{3}{16} - \frac{4}{16} - \frac{24}{16} + \frac{48}{16} + \frac{16}{16}$

$= \frac{39}{16}$

แทนค่า ขอบ

$f(-1) = 3 + 2 - 6 - 6 + 1$

$= -6$

$f(2) = 3(2)^4 - 2(2)^3 - 6(2)^2 - 6(2) + 1$

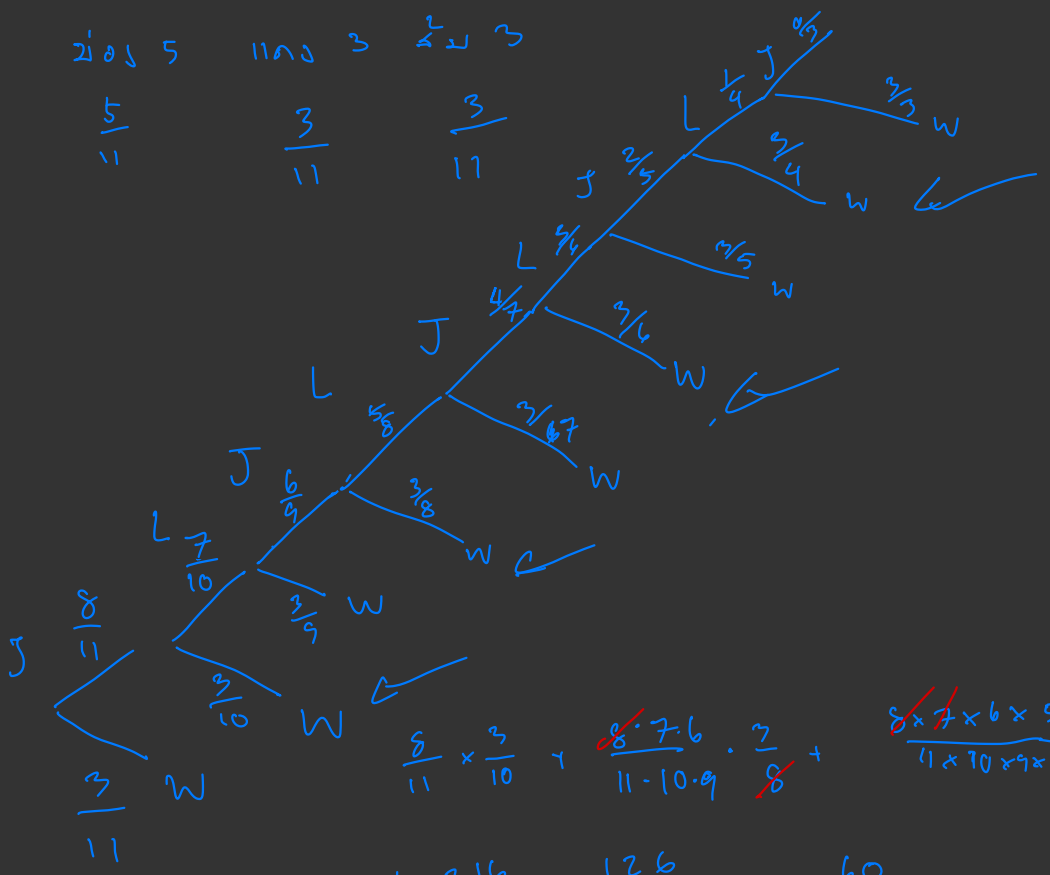
$= 48 - 16 - 24 - 12 + 1$

$= -3$

ข้อ 3

ม่อง 5 แดง 3 ส้ม 3

$\frac{5}{11}$ $\frac{3}{11}$ $\frac{3}{11}$



$$\frac{8}{11}\times\frac{3}{10} + \frac{\cancel{8}\cdot 7\cdot 6}{11\cdot 10\cdot 9}\cdot\frac{3}{\cancel{8}} + \frac{\cancel{8}\times\cancel{7}\times 6\times 5\cdot 4}{11\times 10\times 9\times\cancel{8}\cdot\cancel{7}}\times\frac{3}{6} + \frac{\cancel{8}}{11}\left(\frac{\cancel{7}}{10}\right)\left(\frac{\cancel{6}}{9}\right)\left(\frac{\cancel{5}}{\cancel{8}}\right)\left(\frac{\cancel{4}}{\cancel{7}}\right)\left(\frac{3}{\cancel{6}}\right)\left(\frac{2}{\cancel{5}}\right)\left(\frac{3}{\cancel{4}}\right)$$

$$+\frac{216}{990} + \frac{126}{990} + \frac{60}{990} + \frac{18}{990}$$

$$= \frac{414}{990} = \frac{46}{110}$$

$$\begin{bmatrix} 1 & 2 & 2 \\ 2 & -1 & -1 \\ 4 & 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 4 \\ -3 \\ 3 \end{bmatrix}$$

$$\left[\begin{array}{ccc} 1 & 2 & 2 \\ 2 & -1 & -1 \\ 4 & 1 & 2 \end{array}\right] \left[\begin{array}{c} 4 \\ -3 \\ 3 \end{array}\right]$$

$2R_2 + R_1 \to R_1$;

$$\left[\begin{array}{ccc} 5 & 0 & 0 \\ 2 & -1 & -1 \\ 4 & 1 & 2 \end{array}\right] \left[\begin{array}{c} -2 \\ -3 \\ 3 \end{array}\right]$$

$R_1 \times \frac{1}{5}$;

$$\left[\begin{array}{ccc} 1 & 0 & 0 \\ 2 & -1 & -1 \\ 4 & 1 & 2 \end{array}\right] \left[\begin{array}{c} -\frac{2}{5} \\ -3 \\ 3 \end{array}\right]$$

$R_2 + R_3 \to R_3$

$$\left[\begin{array}{ccc} 1 & 0 & 0 \\ 2 & -1 & -1 \\ 6 & 0 & 1 \end{array}\right] \left[\begin{array}{c} -\frac{2}{5} \\ -3 \\ 0 \end{array}\right]$$

R

$0.2 \sim 25 - 200 - 675 - 900 - 400$

$0.2 + 25 - 200 + 675 - 900 + 400$

$0.4 \sim 400 \qquad -1800$

$\frac{7}{13}\left(\frac{1}{2}\right) \quad \frac{10}{18}\left(\frac{1}{2}\right)$

$$\frac{dx}{dt} = ax - bxy$$

$$\int dx = \int ax - bxy \, dt$$

$$dx = adX - bd\int xy \, dt$$

$$by = -bcY - bd\int xy \, dt$$

$$dx - by = adX + bcY$$

$$\frac{8}{11}\left(\frac{3}{11}\right) - 1$$

$$\frac{8}{11}\left(\frac{3}{11}\right)$$

$$\frac{3}{11}\left(\frac{8}{11}\right)^{n}\left(\frac{8}{11}\right)^{n-1}$$

$$\frac{3}{\cancel{11}}\left(\frac{\cancel{11}}{8}\right)\left[\frac{8}{11}\right]^{24}$$

$$\frac{3}{8}\left(\frac{8}{11}\right)$$

$$1 - \frac{8}{11}\frac{3}{11}$$

$$\frac{24}{\cancel{121}} \quad \frac{\cancel{121}}{57}$$

$$\frac{24}{57}$$

$$\frac{8}{29}$$

$$a_1 \frac{(1-r^n)}{1-r} \rightarrow \frac{3}{11}$$

2	4	6	8	10	6	7	8
1	2	3	4	5			

$$\frac{64}{121} \qquad \frac{3}{8}\left[1 - \right.$$

$$\frac{3/8}{1 - \frac{64}{121}}$$

$$\frac{121}{64} - 57$$

$$\frac{\cancel{57}}{121}$$

$$\frac{\cancel{57}\,121}{8(\cancel{57})}$$

$$29$$

13

$$f(t) = te^{-2t}\sin^2 t$$

$$\mathcal{L}\{f(t)\} = \int_{0^-}^{\infty} e^{-st} f(t)\,dt$$

$$= \int_{0^-}^{\infty} te^{-2t-st}\sin^2 t\,dt$$

$$v = te^{-2t-st}$$

$$\frac{dv}{dt} = t(-2-s)e^{-2t-st} + e^{-2t-st}$$

$$= \left(t(-2-s)+1\right)e^{-2t-st}$$

$du =$

$$1 = (x)\,\frac{f(0)+f(x)}{2}$$

$$\int = \frac{x}{2}\left[0.2 + f(x)\right]$$

v) 9

$$\frac{x\,dy - y\,dx}{x} = \cos\left(\frac{2y}{x}\right) dx$$

$$\frac{x\,dy}{x} - \frac{y\,dx}{x} = \cos\left(\frac{2y}{x}\right) dx$$

$$\int dy = \int \left[\cos\left(\frac{2y}{x}\right) + \frac{y}{x}\right] dx$$

$$y = \int \cos\left(\frac{2y}{x}\right) dx + \int \frac{y}{x}\, dx$$

$$u = \frac{2y}{x}$$

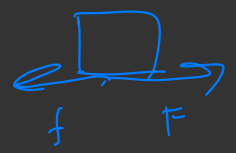
$$\frac{du}{dx} = \frac{2x\frac{dy}{dx} - 2y}{x^2}$$

$$\frac{dy}{dx} = \frac{2}{x}\frac{dy}{dx} - \frac{2y}{x^2}$$

$$\omega = \omega_0 + \alpha t$$

$$\frac{d\theta}{dt} = \omega_0 + \alpha t$$

$$\int d\theta = \int \omega_0 + \alpha t \, dt$$



$$Q = m c \Delta T$$

$$= 15(0.5)(0.24)$$

$$= 1.8 \text{ kJ}$$

$$\mu mg(80) = 1.8 \text{ kJ}$$

$$\mu 15(10)80 = 1.8 \times 10^3$$

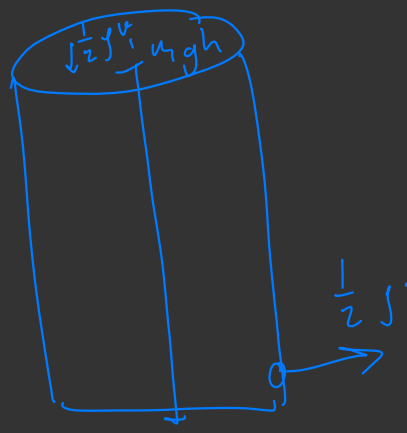
$$= \frac{1.8 \times 10^3}{12 \times 10^3} = \frac{0.3}{2}$$

$$\frac{15}{100}$$

0.18
5
60
12

4
15
8
120

$$x_{cm} = \int r \, dm$$



$mg\,dh =$

$$A_1 v_1 = A_2 v_2$$

$$A_1 \frac{dh}{dt} = A_2 \sqrt{2gh}$$

$$\frac{dh}{dt} = \frac{A_2}{A_1}\sqrt{2gh}$$