

$$f(2) = 8 = 4g(2) \quad (7)$$

$$g(2) = 2$$

$$f'(x) = x^2 g'(x) + 2xg(x)$$

$$f'(2) = (4)(5) + (4)(2) = 28 \quad (d)$$

(8) نجعل $f(x)$ موضع قانون

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

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

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

$$f'(x) = \frac{(1)(-4x)}{(1 - 2x^2)^2}$$

$$f'(1) = \frac{-4}{1} = -4 \quad (d)$$

$$f'(x) = nx^{n-1} \quad (9)$$

$$f''(x) = n(n-1)x^{n-2}$$

$$f'''(x) = n(n-1)(n-2)x^{n-3}$$

$$n(n-1)(n-2) = 120$$

نبحث عن 3 أعداد متتالية ضربهم 120 وهم

$$4 \times 5 \times 6$$

$$n = 6 \quad (a)$$

حل ورقة عمل (2)

حل السؤال الأول:

$$f'(x) = \frac{-C(2x)}{(x^2+1)^2} \quad (1)$$

$$f'(1) = \frac{-2C}{4} = 1 \rightarrow C = -2 \quad (d)$$

$$f'(x) = (ax^2 + 1)(3x^2) + (x^3 - 1)(2ax) \quad (2)$$

$$f'(1) = (a + 1)(3) + 0 = 2$$

$$a = \frac{-1}{3} \quad (b)$$

$$f(2)g'(2) + g(2)f'(2) \quad (3)$$

$$(1)(3) + (-1)(-2) = 5 \quad (c)$$

$$\frac{g(2)f'(2) - f(2)g'(2)}{(g(2))^2} \quad (4)$$

$$= \frac{(-1)(-2) - (1)(3)}{1} = -1 \quad (d)$$

$$\left(\frac{1}{g}\right)'_{(2)} = \frac{(-1)(g'(2))}{g^2(2)} = \frac{-3}{1} \quad (c) \quad (5)$$

$$\text{لأنهم ثوابت} \quad (d) \quad (6)$$

$$f(x) = \frac{2-x}{2} \quad (15)$$

$$f'(x) = \frac{-1}{2} \quad (c)$$

$$f'(x) = \cos x \quad (16)$$

$$f''(x) = -\sin x$$

$$(f' \cdot g)'(x) = f'(x)g'(x) + g(x)f''(x)$$

$$(f' \cdot g)'(\pi) = f'(\pi)g'(\pi) + g(\pi)f''(\pi)$$

$$= (-1)(2) + 0 = -2 \quad (a)$$

$$y' = \cos x - \sin x \quad (17)$$

$$(y')^2 = \cos^2 x - 2 \sin x \cos x + \sin^2 x$$

$$= 1 - \sin 2x$$

$$(y)^2 = \sin^2 x + 2 \sin x \cos x + \cos^2 x$$

$$= 1 + \sin 2x$$

$$(y')^2 + (y)^2 = 2 \quad (b)$$

$$f'(x) = 2 \cos x - 3 \sin x \quad (18)$$

$$f''(x) = -2 \sin x - 3 \cos x$$

$$f'''(x) + f(x) = 0 \quad (c)$$

$$\frac{\Delta y}{\Delta x} \text{ نجد } f'(-1) \text{ من } (10)$$

$$f'(-1) = 0 \quad (\text{مماس أفقي})$$

$$g'(-1) = (1)(0) + (1)(-2) = -2 \quad (d)$$

$$x = 1 \text{ يقطع مستقيم يمر } (0, 1), (2, 3) \quad (11)$$

$$m = \frac{3-1}{2-0} = 1$$

$$y - 1 = 1(x - 0)$$

$$y = x + 1 \begin{cases} f(1)=2 \\ f'(1)=1 \end{cases}$$

$$h'(x) = \frac{f(x) - xf'(x)}{f^2(x)}$$

$$h'(1) = \frac{2-1}{2^2} = \frac{1}{4} \quad (c)$$

$$(b) \quad f'(4) = 0 \text{ لأن الاقتران ثابت } (12)$$

$$\{-2, 0, 2, 3\} \quad (b) \quad (13)$$

$$f'(x) = \frac{(-\pi)(-\sin x)}{\cos^2 x} \quad (14)$$

$$f'(\pi) = 0 \quad (a)$$

$$y = 0 \text{ يقطع محور } x \text{ عندما } f(x) \quad (23)$$

$$\sin x + \cos x = 0$$

$$\tan x = -1 \rightarrow x = 135^\circ$$

$$x_1 = \frac{3\pi}{4} \rightarrow \left(\frac{3\pi}{4}, 0\right)$$

$$f'(x) = \cos x - \sin x$$

$$m = -\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} = \frac{-2}{\sqrt{2}} = -\sqrt{2}$$

$$y - 0 = -\sqrt{2} \left(x - \frac{3\pi}{4}\right) : \text{معادلة المماس}$$

$$(c) \quad y = \frac{1}{\sqrt{2}} \left(x - \frac{3\pi}{4}\right) : \text{معادلة العمودي}$$

حل السؤال الثاني:

$$x_1 = 1, \quad y_1 = \frac{c}{2}$$

$$m = \frac{-c}{4}$$

$$y - \frac{c}{2} = \frac{-c}{4}(x - 1) \text{ معادلة المماس}$$

$$y = 0 \text{ نعوّض } B$$

$$B(3, 0)$$

$$x = 0 \text{ نعوّض } A$$

$$A\left(0, \frac{3c}{4}\right)$$

$$\text{Area} = \frac{9}{4} = \frac{1}{2} \cdot 3 \cdot \frac{3c}{4}$$

$$C = 2$$

$$f'(x) = -\sin x - \frac{1}{2} = 0 \quad (19)$$

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

$$x = 30^\circ + 180^\circ = 210^\circ = \frac{7\pi}{6} \quad (b)$$

$$f'(x) = \frac{(x)\left(\frac{1}{x}\right) - \ln x}{x^2} \quad (20)$$

$$f'(x) = \frac{1 - \ln x}{x^2}$$

$$f'(1) = 1 \quad (b)$$

$$f(x) = \sec x + \tan x \quad \text{نيسط الاقتران} \quad (21)$$

$$x_1 = \pi \rightarrow y_1 = -1$$

$$f'(x) = \sec x \tan x + \sec^2 x$$

$$\text{المماس } m = 0 + 1 = 1$$

$$y + 1 = 1(x - \pi)$$

$$y = x - \pi - 1 \quad (c)$$

$$\frac{dy}{dx} = x^n e^x + n x^{n-1} e^x \quad (22)$$

$$\left. \frac{dy}{dx} \right|_{x=1} = e + ne = 6e$$

$$1 + n = 6 \leftarrow e \text{ بالقسمة على}$$

$$n = 5 \quad (c)$$