

إعدادي ٢٠٢٠

الرياضيات

الفاضاف

محاضرة المشتقات العليا-وقاعدة لايبنز

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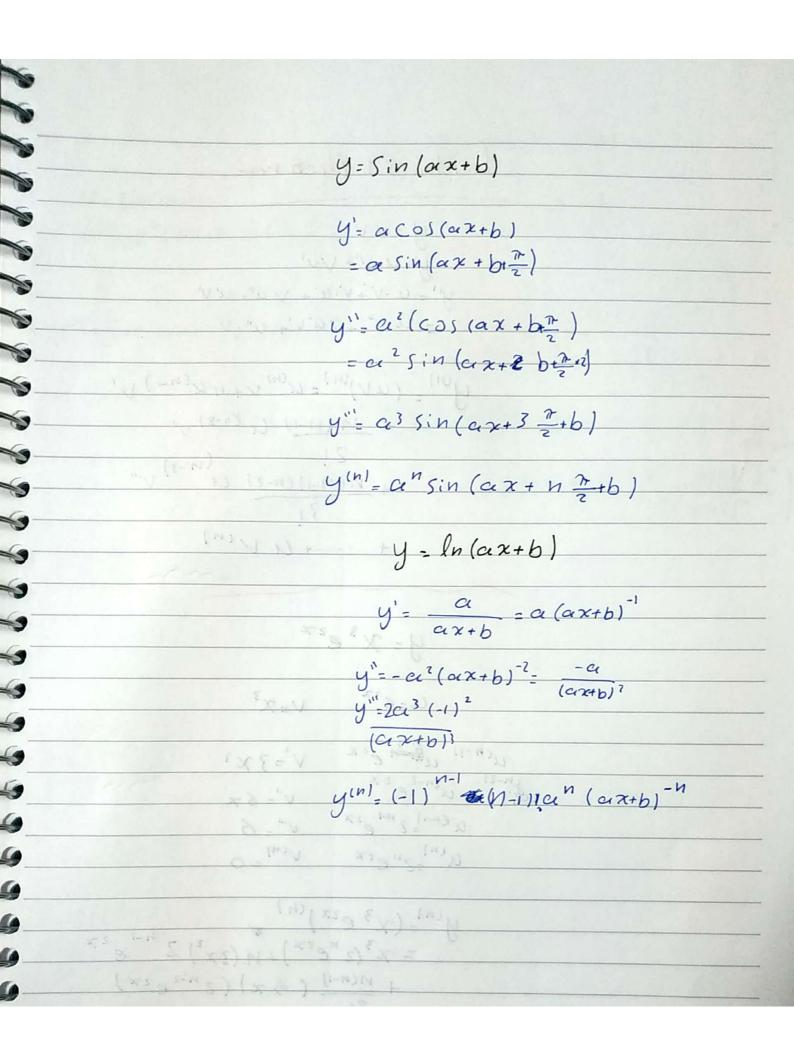
Higher derivatives and leibntes theren

 $y'', f'(x), D_{x}, \frac{\partial y}{\partial x}$ $y'', f''(x), \dots, \frac{\partial y}{\partial x^{2}}$ $y''', f'''(x), \dots, \frac{\partial y}{\partial x^{3}}$ $y''', f'''(x), \dots, \frac{\partial^{3}y}{\partial x^{3}}$ $y'''', f'''(x), \dots, \frac{\partial^{3}y}{\partial x^{3}}$ $y''''', f'''(x), \dots, \frac{\partial^{3}y}{\partial x^{3}}$ $y'''', f'''(x), \dots, \frac{\partial^{3}y}{\partial x^{3}}$

 $y' = 12 \times^{3} - 36 \times^{2} + 10 \times$ $y'' = 36 \times^{2} - 72 \times^{4} + 10$ $y''' = 72 \times - 72$ y''' = 72 y'' = 72

y'= α e αχ y"= α e αχ y"= α e αχ

y"=aneax



Leibnts's theo rem

y=uv y'= u.v'+ vu' y''= u.v"+ v'.u' + v u"+ u'v' - U.V" + Zu'V'+ u".V

+ M (n-1) (((n-2)) (N-3) V" n(n-1)(n-2) U

V'= 3 x? 12 = 12 = 5 x u kn-1]= 2 n-1 e 2 x

u(n)=znezx

y"= (x3 e2x)") = x3(2"ezx)+n(3x2) 2"-1e2x + N(n-1) (6x) (2n-2 exx) + n(n-1)(n-2) (8) (n n-3 ex)

0

-

0

4

E

2"x3e2x+3nx22"+e2x + M(n-1)(n-2) (2 n-3) e 2x

y = Sin (2x+3) In (3x+2) V= ln (3 x+2) V(n)= (-1) n-1 (n-1) 1 3 n U = Sin(2x+3) u(n) -2"(2x+3+n=) (3x+2)n y(n) = [Sin (2x+3) ln(3x+n)] = 2" Sin(2x+3+n]]. ln(3x+2) $+ n 2^{n-1} Sin(2x+3+(n-1)\frac{\pi}{2}(\frac{3}{(3x+2)})$ $+\frac{h(n-1)}{2!}\frac{2^{n-2}\sin(2x+3+(n-2)^{\frac{n}{2}})\left(-3^{2}\right)}{(3x+2)!}$

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