(2)

$$y'' = \pm x^{-\frac{1}{2}} \quad y'' = \pm x(-\pm)x^{-\frac{3}{2}}, \quad y'' = \pm x(-\pm)x(-\frac{3}{2}) \cdot x^{-\frac{5}{2}}$$

$$y'' = -\frac{(2n-3)!!}{2!!} x^{-\frac{19}{2}} \quad (n=10) = \frac{-17!!}{2!!} x^{-\frac{19}{2}}$$

$$(x) \stackrel{!}{=} y = \frac{1}{2} \cdot (ux)$$

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

$$(ux)^{(n)} = (\frac{1}{x})^{(n-1)}$$

$$(ux)^{(n)} = (\frac{1}{x})^{(n-1)}$$

$$= \frac{1}{27} (x)^{(n-1)}$$

$$= \frac{1}{$$

9) 
$$\mathbb{R}^{f(x)} = \chi^3$$
,  $g(x) = e^x$   
 $y^{(n)} = C_n^0 \chi^3 e^x + C_n^1 \cdot 3\chi^2 e^x + C_n^2 \delta x \cdot e^x + 4C_n^3 e^x$   
 $y^{(n)} = \chi^3 e^x + 3n\chi^2 e^x + 3n(n+1)\chi e^x + n(n+1)(n-2)e^x$ 

(4)

(5)

5. (3) 
$$y'-2 = (1-y')\ln(x-y) + \frac{1-y'}{x-y}(x-y)$$
  

$$y' = \frac{\ln(x-y)+3}{2+\ln(x-y)} = 1 + \frac{1}{2+\ln(x-y)}$$

$$y'' = \frac{-x-y(1-y')}{[2+\ln(x-y)]^2} - \frac{1}{[2+\ln(x-y)]^3(x-y)}$$

(6)

b. 
$$f(x) = \frac{1}{1+x^2}$$
,  $(1+x^2)f(x) = 1$ 

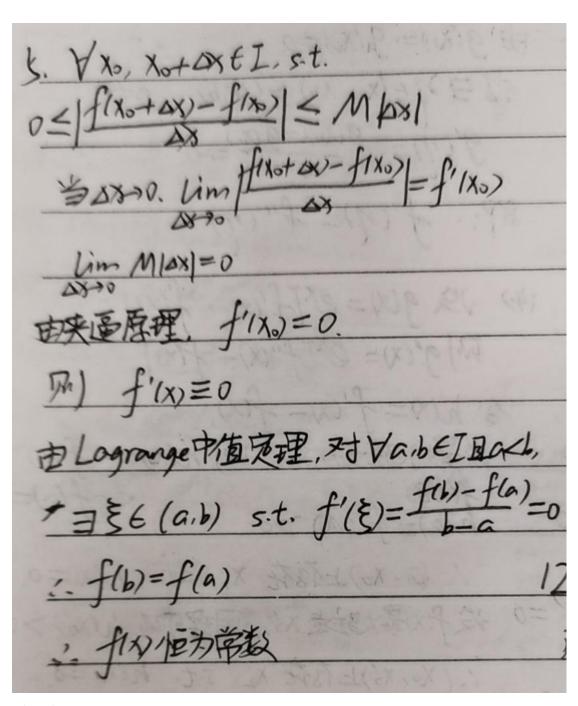
$$\frac{1}{x^2} \left( \frac{1}{x^2} \right) \left( \frac{$$

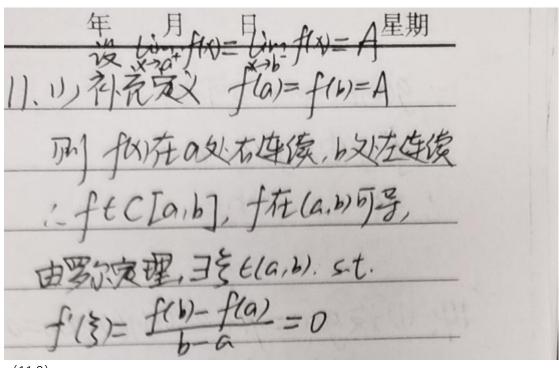
(7)

7. 
$$f(x) = 2ansins$$
.  $\sqrt{1-x^2}$ 
 $\sqrt{1-x^2}f''(x) = 2ansins$ 
 $\sqrt{1-x^2}f''(x) - \sqrt{1-x^2-2}f''(x)$ 
 $= \sqrt{1-x^2}$ 
 $\sqrt{1-x^2}f''(x) - xf'(x) = 2$ 
 $\sqrt{1-x^2}f''(x) - xf'(x) = 2$ 
 $\sqrt{1-x^2}f''(x) - xf'(x) = 2$ 
 $\sqrt{1-x^2}f''(x) = 2$ 
 $\sqrt{1-x^2}f''($ 

才施生1.

2 アダ帯数  $a_0, a_1, ..., a_n$  |  $a_n + a_{n+1} + a_{n+1} + a_1 + a_2 + a_0 = 0$ . |  $i = n + 2 + a_0 = 0$ . |  $i = n + 2 + a_0 = 0$ . |  $i = n + 2 + a_0 = 0$ . |  $i = n + 2 + a_0 + a$ 





(11.2)

(2) 沒 lim  $f(x) = \lim_{x \to a} f(x) = A \in \mathbb{R}$ . 考虑  $g(x) = \begin{cases} A, & x = a \\ f(x), & x > a \end{cases}$  在  $[a, +\infty)$  可要 考察 x= |a|+1 > a 1°若g(la1+1)=g(a)=A,由罗定建, ∃ € (a, |a|+1) \( (a,+∞), s.t.  $g(\xi) = f'(\xi) = 0$ 2° 若 g((a)+1) ≠ A, 不好没 g(la)+1) > A. : lim g(x) = A . I + 12 | CME, OCA - (1+12) = 3 tx :-只要 x>M,京尤有 g(x)-A < E, => g(1x) < g(|a|+1) 而g(X)在[a,M]上有最大值B,且 B > g(|a|+1) > g(a) = A 若B=g(M),则g(M)是g(x)的最大值。 由费马定程 g'(M)=f'(M)= o. #B>g(M), 则∃美€(a,M), g(为)=B, 9'(5)=f'(5)=0.

当g(lal+1)<A时同理,找最小值即可. 证件.

可: 相应结论成立.

若改成(-∞, a),则考虑 g(-|a|-1)即可若改成(-∞,+∞),则考虑 f(o),若f(o)=A,则问题等同于(2),拆分为两(则区间考察.若f(o)>(<)A,则利用两(则极限的定义,根据f(o)值找到一段区间上的最大(小)值即可.

13. 
$$\frac{1}{2}H(x) = [f(a)g(b) - f(b)g(a)][h(x) - h(a)] + [g(a)h(b) - g(b)h(a)][f(x) - f(a)] + (h(a)f(b) - h(b)f(a))(g(x) - g(a))$$
 $H(a) = H(b) = 0$   $\therefore \exists 3 \in (a, b) \text{ s.t. } H'(3) = 0$ 
 $f(b) g(a) h(a)$ 
 $f(b) g(b) h(b) = 0$ 
 $f'(3) g'(3) h'(3)$ 

(14)

```
14、(1) 没 g(x)= f(x) e', Fr/g(x)=g(b)=0.

g'(x)=[f'(x)+f(x)]e'

g'(x)=[f'(x)+2f'(x)+f(x)]e'

g'(x)=[f'(x)+2f'(x)+f(x)]e'

g'(x)=[f'(x)+2f'(x)+f(x)]e'

g'(x)=[f'(x)+2f'(x)+f(x)]e'

g'(x)=[f'(x)+2f'(x)+f(x)]e'

g'(x)=[f'(x)+2f'(x)+f(x)]e'

g'(x)=[g'(x)-g'(x)]=0

g'(x)=[g'(x)-g'(x)]=0
```

(2) 1/2 g(x) = f(x)ex

(2) 1/2 g(x) = f(x)ex

(3) g'(x) = f(x)ex

(4) g'(x) = f(x)ex

(5) g'(x) = f(x)ex

(6) g'(x) = f(x)ex 由11). 日XoE(04) st g(16)=0. 由Lagrange种植灾理:  $\exists x \in (a, x_0) \text{ s.t. } g'(x_0) = \frac{g(x_0) - g(a)}{x_0 - a} = 0$   $\exists x \in (x_0, b) \text{ s.t. } g'(x_0) = \frac{g(b) - g(x_0)}{b - x_0} = 0$   $\exists \theta \in (x_0, x_0) \text{ s.t. } g''(\theta) = \frac{g'(x_0) - g'(x_0)}{x_0 - x_0} = 0$   $\exists P \int f''(\theta) - 2f'(\theta) + f(\theta) = 0.$ 

(3) 39 (x)=ex f (x), PU g'(w)= ex (f(x) f (x)) 9 (a) = g(b)= (D) = 10 (a, b) (野宝禄里). o=(aX) P. t.2 EP f(x)-f(x)=0 3 G(0= +(x) - +(x) + (x) - +(x) Elim G(x) lim G(x) >0 若りならんはあり、大村の s.t. G(XI)=0 则由野淀理, ヨり((a,b)s.t. な(力)=0 若G(X)在(a,b)仅一零点Xo,则 X为G(X)树盾总中野定理: G'(X0) = 0 综上, 3月 E(a,b), s.t. G'(内) => 即 f'(n)=f'(n)

(4)由(3)知:

3xe(a,b), st. f(x)-f(x)=3

3 M(x) = ex(f(x)-f(x))

P) M(x) = ex (f(x)-f(x))

Plym M(x) Lim M(x) > 0, M(x)=0

若三太(a,b), 註. 本丰物,

st. M(x)=0

PU時點理:

ヨら E(a,b), s.t. M(多) 20 若(a,b)上M(X)仅太一個点,则其为根值。 時間定理: M(X) 20 综上, ヨ ら E(a,b), s.t. M(ら) 20 即 f'(ら)=f(ら)