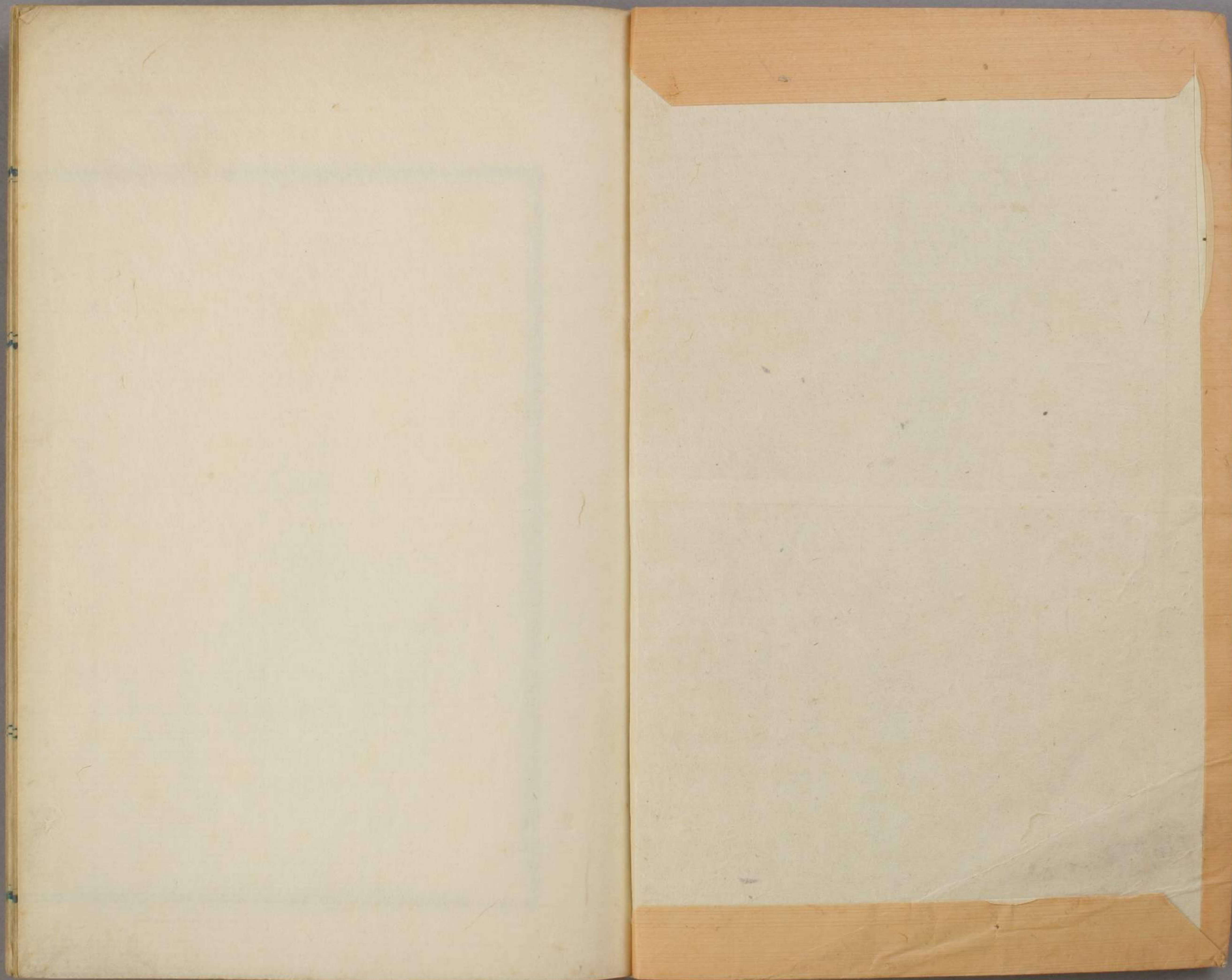
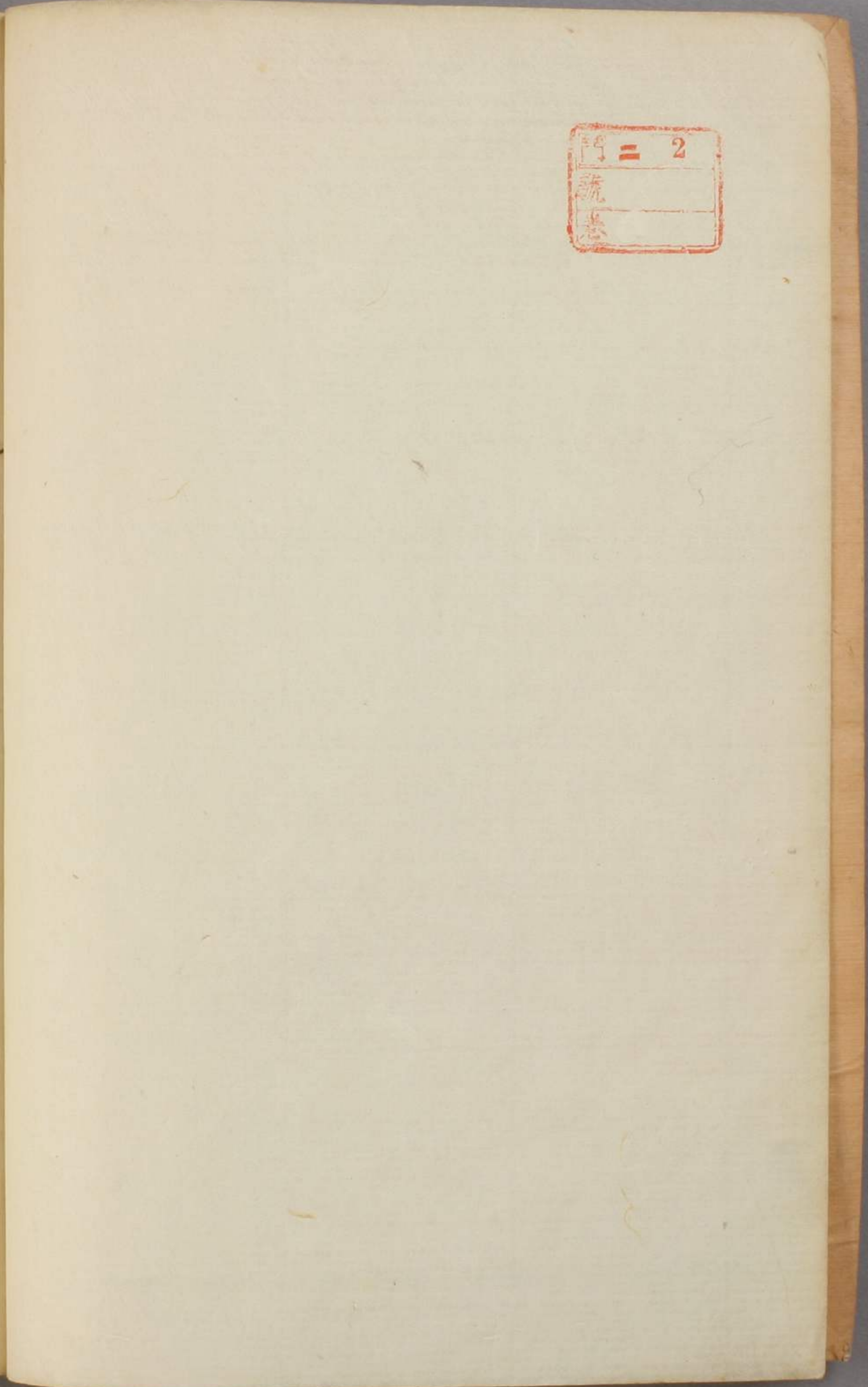
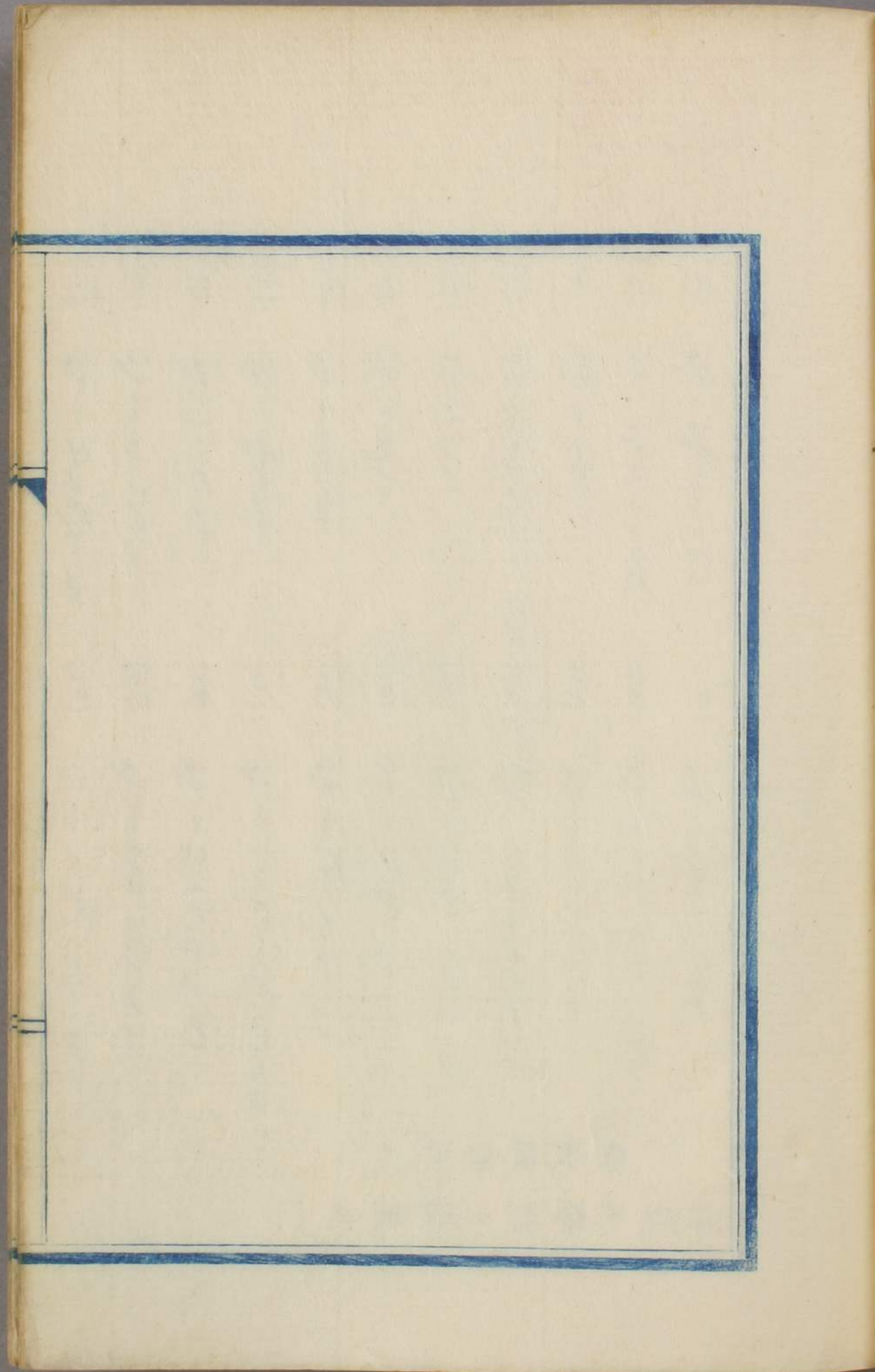


洋算例題微分篇

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二
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詳算例題續々篇卷之一
 函數微分各式

- | | | | |
|------|---|------|---|
| (1) | $\partial x : \partial y = 1 : 8x$ | (12) | $\partial y = 27a^2 e x^6 \partial x$ |
| (2) | $\partial x : \partial y = 1 : 3x^2$ | (13) | $\partial y = (2x^2 + 2x + 1) \partial x$ |
| (3) | $\frac{\partial y}{\partial x} = 4x^3$ | (14) | $\partial y = (200x - 2) \partial x$ |
| (4) | $\partial y = 48$ | (15) | $\partial y = (7a - 4.5x) x^2 \partial x$ |
| (5) | $\partial y = 2600$ | (16) | $\partial y = (24x^2 - 15x^2 - 2) \partial x$ |
| (6) | $\partial y = 2560$ | (17) | $\partial y = 3(5x^6 - 2x + 2) \partial x$ |
| (7) | $\partial y = 1500^2 \partial x$ | (18) | $\partial y = 6x(ax + x^2) \partial x$ |
| (8) | $\partial y = \frac{7}{2} x \partial x$ | (19) | $\partial y = (35x^4 + 18x^2 - 10x + 3) \partial x$ |
| (9) | $\partial y = 13x^4 \partial x$ | (20) | $\partial y = 2(2x^2 \partial x + 2 \partial x)$ |
| (10) | $\partial y = 42(2x^3) \partial x$ | (21) | $\partial y = 2x2(2 \partial x + x \partial x)$ |
| (11) | $\partial y = 2806^2 x^7 \partial x$ | (22) | $\partial y = 6x2^2(2 \partial x + 2x \partial x)$ |



(22)	$\partial z = ax^2(5x^2+6b) \partial x$	(24)	$\partial u = 2(22x+2x^2 \partial y + 2x^2 \partial z)$
(23)	$\partial y = (a^2+2ax+2ax^2+2x^3) \partial x$	(25)	$\partial u = 3ax(2x^4+5ax^2+ax+8ab) \partial x$
(24)	$\partial y = (a+b+2x) \partial x$	(26)	$\partial y = \frac{x(2ax \partial x - 2x \partial u)}{2x^2}$
(25)	$\partial y = 2(5x^2+a+8x) \partial x$	(27)	$\partial y = -\frac{na \partial x}{x^{n+1}}$
(26)	$\partial y = 3x(5x^2+2a+6x) \partial x$	(28)	$\partial y = -\frac{2ca \partial x}{x^2}$
(27)	$\partial y = (1+3x^2+4x^3+6x^4) \partial x$	(29)	$\partial y = -\frac{2ca \partial x}{x^2}$
(28)	$\partial y = (m+n)x^2(a+bx)(2an+2bm+5bx) \partial x$	(30)	$\partial y = (c+bx)^2(c+bx)(2aacx^2+2abbx^2+3bce) \partial x$
(29)	$\partial y = (c+bx)^2(c+bx)(2aacx^2+2abbx^2+3bce) \partial x$	(31)	$\partial y = \frac{2x(a^2+b^2) \partial x}{(8x-x^2)^2}$
(30)	$\partial u = xyx^2(2y \partial x + 2x \partial y + 2x^2 \partial z)$	(32)	$\partial u = 2(2x^2+ax+2bx^2+ab) \partial x$
(31)	$\partial u = xyx^2(2y \partial x + 2x \partial y + 2x^2 \partial z)$	(33)	$\partial u = \frac{2x \partial x}{\sqrt{1+x^2}}$
(32)	$\partial u = ay^2x^2(2z \partial x + 2x \partial y + 2x^2 \partial z)$	(34)	$\partial u = \frac{2(c+\sqrt{x^2})^2 \partial x}{2\sqrt{x}}$
(33)	$\partial u = 2(2x^2+ax+2bx^2+ab) \partial x$	(35)	$\partial y = \frac{2}{n} x^{\frac{1}{n}-1} \partial x$
(34)	$\partial u = \frac{2(c+\sqrt{x^2})^2 \partial x}{2\sqrt{x}}$	(36)	$\partial u = \frac{\sqrt{x+\sqrt{1+x^2}} \partial x}{2\sqrt{1+x^2}}$
(35)	$\partial y = \frac{2}{n} x^{\frac{1}{n}-1} \partial x$	(37)	$\partial y = \frac{5}{2} \sqrt{ax} \cdot x^2 \partial x$
(36)	$\partial y = \frac{2ca \partial x}{2\sqrt{x}}$	(38)	$\partial y = \frac{7}{2} \sqrt{ax} \cdot x^2 \partial x$
(37)	$\partial y = \frac{2}{5} ax x^{-\frac{2}{5}} \partial x$	(39)	$\partial y = \frac{2x}{(1-x)^2}$
(38)	$\partial u = \frac{(a^2+abx^2-4x^2) \partial x}{\sqrt{ax-x^2}}$	(40)	$\partial y = \frac{2x(a^2+b^2) \partial x}{(8x-x^2)^2}$
(39)	$\partial u = -3ax^{-4} \partial x$	(41)	$\partial y = \frac{2x(a^2+b^2) \partial x}{(8x-x^2)^2}$

(42)	$\partial y = a(n+1)x^n \partial x$	(50)	$\partial u = xy^2(2y \partial x + 2x \partial y - \frac{1}{2} \partial z)$
(43)	$\partial u = \frac{x \partial x}{\sqrt{1+x^2}}$	(51)	$\partial u = \frac{(2x-x^2) \partial x}{2(a-x)^{\frac{3}{2}}} + 2xy \partial x$
(44)	$\partial u = \frac{2(c+\sqrt{x^2})^2 \partial x}{2\sqrt{x}}$	(52)	$\partial u = \frac{\sqrt{x+\sqrt{1+x^2}} \partial x}{2\sqrt{1+x^2}}$
(45)	$\partial y = \frac{2}{n} x^{\frac{1}{n}-1} \partial x$	(53)	$\partial y = \frac{5}{2} \sqrt{ax} \cdot x^2 \partial x$
(46)	$\partial y = \frac{2ca \partial x}{2\sqrt{x}}$	(54)	$\partial y = \frac{7}{2} \sqrt{ax} \cdot x^2 \partial x$
(47)	$\partial y = \frac{2}{5} ax x^{-\frac{2}{5}} \partial x$	(55)	$\partial y = \frac{5}{2} \sqrt{ax} \cdot x^2 \partial x$
(48)	$\partial u = \frac{(a^2+abx^2-4x^2) \partial x}{\sqrt{ax-x^2}}$	(56)	$\partial y = \frac{2 \partial x}{2\sqrt{x}} - \frac{2x}{5}$
(49)	$\partial u = -3ax^{-4} \partial x$	(57)	$\partial y = \frac{\sqrt{a+2cx} \partial x}{2\sqrt{x}}$

$$(58) \quad dy = \frac{8x^2 dx}{(2x+8)^2}$$

$$(60) \quad dy = \frac{(x^2 - 8^2) dx}{x^2}$$

$$(59) \quad dy = 8x^2(2x^2 + 5ax + 2x^2) dx$$

$$(67) \quad dy = \frac{8x}{(a+2x)^2} (a-2x^2) dx$$

$$(60) \quad dy = \frac{(a+28x+2cx^2) dx}{2\sqrt{(ax+bx^2+cx^2)}}$$

$$(68) \quad dy = -\frac{2x^2 dx}{(a+2x)^2}$$

$$(61) \quad dy = 5x^4 (a-x)^4 (a-2x) dx$$

$$(69) \quad dy = \frac{2x}{2x(1-2x)+1-x^2}$$

$$(62) \quad dy = dy = \frac{1}{2}(a+8x^2)^{\frac{1}{2}} \cdot 8x dx$$

$$(70) \quad dy = \frac{6(1-x^2) dx}{x^2(2+x)^2}$$

$$(63) \quad dy = \frac{2x}{2} (a+x^2)^{\frac{1}{2}-1} dx$$

$$(71) \quad dy = \frac{2ax^2 dx}{(a^2-x^2)\sqrt{a^2-x^2}}$$

$$(64) \quad dy = \frac{(a-2ax-x^2) dx}{2(a+x^2)^2}$$

$$(72) \quad dy = \frac{-2x(2a^4+2a^2x^2-x^4) dx}{(a^4+a^2x^2+x^4)^2}$$

$$(65) \quad dy = \frac{(4x\sqrt{x+a}) dx}{2\sqrt{x(x^2+a\sqrt{x})}}$$

$$(72) \quad dy = -\frac{(a^2-ax+8x^2) dx}{\sqrt{a^2+2x}}$$

$$(81) \quad dy = \frac{2x(x^2-1) dx}{x^2(1+2x+2)^2}$$

$$(74) \quad dy = \frac{1}{2}(a-5x)\sqrt{a+x} dx$$

$$(82) \quad dy = \frac{\frac{1}{2}(a-x)^2}{x^2(a^2-x^2)}$$

$$(75) \quad dy = 8m(a+x)(8ax+x^2)^{m-1} dx$$

$$(83) \quad dy = \frac{2(\sqrt{1+x}-1)^2 dx}{x^2\sqrt{1+x}}$$

$$(76) \quad dy = \frac{8x^2 dx}{8(x^2+1)^2}$$

$$(84) \quad dy = \frac{(x-2)\sqrt{x+1} \cdot dx}{x^2(x-1)^2}$$

$$(77) \quad dy = \frac{2}{2(x^2+1)^2}$$

$$(85) \quad dy = \frac{-2x}{2(1+\sqrt{x})\sqrt{x-x^2}}$$

$$(78) \quad dy = \frac{2x+1}{2x^2}$$

$$(86) \quad dy = \frac{2}{2(x^2+x+2)^2}$$

$$(79) \quad dy = \frac{(4x^2+4x) dx}{2x^2\sqrt{x^2+1}}$$

$$(87) \quad dy = \frac{(x^2-1) dx}{2(x^2+x+2)^2}$$

$$(80) \quad dy = \frac{8x^2 dx}{2(1+2x)^2}$$

(110) $ay = \frac{10}{\sqrt{x}}$

(109) $ay = \frac{1}{2}x$

(108) $ay = bx$

(107) $ay = \frac{1}{2}\sqrt{x}$

(106) $ay = z$

(105) $ay = \frac{30}{\sqrt{x}}$

(104) $ay = \frac{30}{x}$

(103) $ay = z$

(102) $ay = \frac{1}{200}x$

(94) $ay = \frac{(x-\sqrt{1-2x})\sqrt{x}}{x^2(1+2x\sqrt{1-2x})}$

(93) $ay = \frac{1}{x} \times \frac{(x+d)^n + (x+d)^{n-1} + \dots + (x+d)^0}{(x+d)^n + (x+d)^{n-1} + \dots + (x+d)^0}$

(92) $ay = \frac{e(x+d)}{x^2 e^{2x}}$

(91) $ay = \frac{1+x(x+1)}{x^2 e^{1-x}}$

(90) $ay = \frac{e^{2x-20}\sqrt{x}}{x^2(e^{2x-20}\sqrt{x+d})}$

(89) $ay = x^2 e^{-20}\sqrt{x^2}$

(88) $ay = \frac{x^2(e^{2x+20})}{(e^{2x+20})x^2}$

(101) $ay = \frac{1}{200}x$

(100) $ay = \frac{1+\sqrt{1-2x}}{x^2}$

(99) $ay = \frac{e^{2x-20}}{x^2 e^{20}}$

(98) $ay = \frac{x^{n+d+1}\sqrt{x}}{x^2}$

(97) $ay = \frac{x^2(\frac{1}{x}+1)\frac{e^x}{x}}{x^2}$

(96) $ay = \frac{(2x-1)\sqrt{x}}{x^2 e^{2x}}$

(95) $ay = \frac{(x^n+d)\sqrt{x}}{x^2(e^{2x+d})}$

$$(39) \quad y = (x-b)\sqrt{\frac{a-x}{x}} \quad x > b \text{ 或 } x < a$$

此式之 \cup 或 \cap 之通一即形爲
如左

$$(40) \quad \frac{1}{2} \left\{ (b+c) \cos C \pm \sqrt{(b+c)^2 \cos^2 C - 4bc} \right\}$$

$$(41) \quad = - \frac{(a+x)(b^2-x^2)x}{x^2+ab^2}$$

$$(42) \quad p^2 = \frac{a^2 b^2}{a^2 + b^2 - r^2}$$

$$(43) \quad R = \frac{a(1-l^2)}{1-l \cos B}$$

$$(44) \quad p^2 = ar$$

$$(45) \quad \sin^2 C \cdot a = 2ar - r^2$$

$$(46) \quad x = \sqrt{a(a+b)}$$

$$(47) \quad y^2 - x^2 = \frac{a^2 b^2}{a^2 + b^2}$$

$$(48) \quad \frac{\partial y}{\partial x} = \pm \frac{1}{\sqrt{2}} \quad \text{或 } \frac{-a}{2y} \quad \text{或 } \infty$$

故正負由 $\frac{-a}{2y}$ 之正負而定

$$(49) \quad \frac{\partial y}{\partial x} = \tan C = \frac{a}{a^2 b^2} = 0$$

$$(50) \quad \frac{\partial y}{\partial x^2} = - \frac{a(a-x)}{(2ax-x^2)^{\frac{3}{2}}} = 0 \quad x = a$$

$$(12) \quad = \frac{x}{2}$$

$$(14) \quad RPT = \tan^{-1} \sqrt{15}$$

$$(15) \quad \frac{\partial y}{\partial x} = \sqrt{3} = \tan 60^\circ$$

故に漸近線と点と a の所
於て六十度の角を以て引きたる
ものなり

$$(16) \quad y = b\sqrt{25}$$

$$(17) \quad V = \frac{\partial^2}{\partial t^2} \pi ab^2 = 1440$$

$$TPN = ARN$$

(18) 故に平行なるものなり

$$(19) \quad \text{法線} = \frac{y^2}{a}$$

$$(20) \quad -a \frac{\partial a'}{\partial b'} = \frac{b \pm (b^2 - 8a^2)^{\frac{1}{2}}}{2}$$

$$(21) \quad R = \frac{a(1 - e^2)}{(1 - e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

$$(22) \quad R = a$$

$$(23) \quad y = \frac{x^2}{a} - \frac{cx}{a} + \frac{c^2}{a}$$

$$(25) \quad A = 90^\circ$$

$$(26) \quad \frac{\partial y}{\partial x} = \mp \frac{2}{3} \sqrt{\frac{1}{3}}$$

$$(27) \quad \frac{1}{2x} = a \quad \tan \varphi = a$$

$$(28) \quad \sin d = \frac{\tan^2 \frac{1}{2}(a, +a)}{\tan^2 \frac{1}{2}(a, -a)} \sin d$$

(29) 長至四寸

(30) 半至三寸

$$(31) \quad e = \varphi = \varphi$$

$$(32) \quad AT = -x^{\frac{1}{2}}(y^{\frac{3}{2}} + x^{\frac{2}{2}}) = -x^{\frac{1}{2}} a^{\frac{2}{2}}$$

(33) 次切次切相集 $= y^2$

$$(34) \quad x = \frac{a^2}{\sqrt{a^2 - b^2}} = 6.25$$

$$(35) \quad AF^2 = a^{\frac{2}{3}} y^{\frac{2}{3}} x^{\frac{1}{3}}$$

$$(36) \quad b = a \left(\sqrt{\frac{\sqrt{5}+1}{2}} - 1 \right)$$

$$(37) \quad x + y = c = (a+b) \sqrt{\frac{1}{2}}$$

$$(38) \quad x = \frac{ab}{c+d}$$

洋算例題續々篇卷之十五

(1) $\frac{\partial y}{\partial x} = \infty$

(2) $\frac{\partial^2 y}{\partial x^2} = 0$

(3) $\frac{\partial x}{\partial y} = \infty$

(4) $\frac{\partial y}{\partial x} = \pm \frac{2b-a}{\sqrt{x}}$

(5) $\frac{\partial^2 y}{\partial x^2} = + \quad x < a \quad x > a$

$x = -1 \quad x = 0,732$

$\frac{\partial^2 y}{\partial x^2} = + \alpha -$ 故 = 曲点也

$\frac{\partial^2 y}{\partial x^2} = - \alpha +$ 同

$\frac{\partial^2 y}{\partial x^2} = + \alpha -$ 同

$\frac{\partial^2 y}{\partial x^2} = \frac{-p^2}{4q^3}$

子或正(或負)式(5)式負を得

子或負(或正)式(5)式正を得

故小四を以て横軸小向

洋算例題續々篇卷之十六

(1) $e^{\sin x} = 1 + x + \frac{x^2}{2} - \frac{2x^4}{234} - \frac{8x^5}{2345} + \dots$

(2) 漸線 = $\frac{1}{c} y^2$

(3) $\frac{\partial u}{\partial y} = \frac{y-x}{2(x+y)^2} \therefore y = x$

(4) $\left\{ \begin{array}{l} \text{切線} = \frac{2(x^2+a^2)}{2ax} \\ \text{切線} \text{ 及 } \text{切線} \text{ の 和 } = \frac{2x}{a} \end{array} \right.$

(5) $\varphi = \frac{1}{2}\varphi$

(6) $APN = IPA = \frac{1}{2}IPN$

(7) $R = \frac{1}{2r}$

(8) 已知正方形の辺正中を角点と
すべし

(9) $x = -\frac{c}{2c} \quad y = \frac{b}{27c^2}(2b^2 - 9ac)$
故に曲点あるを知る

(10) $AT = 0$ 故に漸近線あるを知る

(11) $\tan l = \frac{\tan l(a^2-b^2)}{a^2+b^2 \tan^2 b}$

(12) $x = 3 \quad l = 63^\circ 26' 06'' \dots$

洋算例題續
 下篇卷之十三
 下

$$(1) R = \sqrt{4000}$$

$$(2) R = 1 \frac{4}{5}$$

$$(3) R = 12 \frac{1}{4}$$

$$(4) R = \frac{(a^2 + b^2)x^2 - a^2}{A^2 B}$$

$$(5) R = \frac{(y^2 + c^2)^2}{6ay^2}$$

$$(6) R = \frac{(y^2 + 1)^{\frac{2}{3}}}{2} = \frac{(m + y^2)^{\frac{2}{3}}}{m^{\frac{2}{3}}}$$

$$(7) R = \frac{a\sqrt{(a-3x)x}}{3(2a-x)}$$

$$(8) R = \frac{b(2ax^2 + a^2b^2 + x^2)^{\frac{2}{3}}}{x^2(2ab^2 - x^2 - 2ax^2)}$$

$$(9) R = \frac{(x^2 + y^2)^{\frac{2}{3}}}{2m^2}$$

$$(10) R = \frac{a}{\sqrt{2}}$$

洋算例題續
 下篇卷之十四

$$(1) (a^2)^{\frac{2}{3}} + (b^2)^{\frac{2}{3}} = (ac)^{\frac{2}{3}} = (a^2 - b^2)^{\frac{2}{3}}$$

$$(2) (a^2)^{\frac{2}{3}} - (b^2)^{\frac{2}{3}} = (a^2 + b^2)^{\frac{2}{3}}$$

$$(3) \text{無}$$

$$(4) \text{無}$$

$$(5) \left(\frac{2}{2a}\right)^{\frac{2}{3}} = \left(\frac{a}{2a}\right)^{\frac{2}{3}} + \frac{b}{a}$$

$$(6) a = 4 \text{ per } a^{-1} \frac{-b}{2} + \sqrt{2ab - b^2}$$

洋算例題續々篇卷之十二

(1) 次切 = $\frac{t^2}{2\pi}$

(2) 次切 = 2π

(3) 次切 = $2n^2\pi$

(4) 次切 = $-a$

(5) 次切 = rm

洋算例題續々篇卷之十三上

(1) $\partial z = \partial x \sqrt{1+4\pi^2 x^2}$

(2) $\partial z = \partial x \sqrt{1+\frac{ax}{x^2}}$

(3) $\partial z = \partial x \sqrt{1+m^2}$

(4) $\partial s = -\frac{a\partial x}{2}$

$$(15) \begin{cases} y^2 = \frac{x^2}{2a-x} \text{ 橢圓式} \\ \delta T = \frac{y^2(2a-x)^2}{2ax^2-x^2} \\ \delta N = \frac{2ax^2-x^2}{(2a-x)^2} \end{cases}$$

$$(16) AT = 0 \text{ 故軸子徑} \\ \text{漸近線}$$

$$(17) AT = -2a$$

$$(18) \delta N = \frac{y^2}{xT}$$

$$(19) \delta T = \frac{y(y^2-ax)}{x^2-ay}$$

$$(20) AB - AT = a$$

$$(21) \delta T^2 = \delta T \cdot \delta R$$

$$(22) \delta T \times \delta N = y^2$$

$$(23) \delta T = 1 = \pi$$

$$(24) \delta T = 2x \log x$$

$$(25) \delta N = \frac{a^2}{2x^2}$$

洋算例題續及篇卷之十一

$$(1) \partial Z = R(R^2-x^2)^{-\frac{1}{2}} \partial x$$

$$(2) \partial S = \partial x \sqrt{2Rx-x^2}$$

$$(3) \partial S = y \partial x = \frac{y^2}{x} \partial y \quad \partial Z = \partial x \sqrt{1+\frac{x^2}{2x}}$$

$$(4) \partial Z = \frac{\partial y}{y} \sqrt{1+y^2}$$

$$(5) \partial S = \frac{2x}{x^2} y \partial y (y^2+x^2)^{\frac{1}{2}}$$

$$(6) \partial Z = \frac{\partial x}{a} \sqrt{a^2-x^2(A^2-B^2)}$$

$$(7) \partial S = \frac{\partial x}{x} (a+x) \sqrt{(b^2-x^2)}$$

$$(8) \partial S = \frac{2\pi B \partial x}{a^2} (a^2-x^2(a^2-b^2))^{\frac{1}{2}}$$

$$(9) \partial S = \frac{y^2 \partial x}{\sqrt{2xy-y^2}} \quad \text{前前} \\ \text{下右}$$

$$(10) \partial S = \frac{2\pi B \partial x}{a^2} (a^2-y^2(a^2-b^2))^{\frac{1}{2}}$$

$$(11) \partial Z = \frac{a \partial x}{2ax} \sqrt{\frac{8a-2x}{(2a-x)}}$$

$$(12) \partial S = \frac{2\pi}{x^2} \partial x (x^2+\beta^2)^{\frac{1}{2}}$$

$$(13) \partial V = \pi(R^2-x^2) \partial x$$

$$(14) \partial S = \frac{\pi y}{a} \partial y (9y^2+4a^2)^{\frac{1}{2}}$$

$$(15) \partial V = \frac{\pi y^2 \partial y}{\sqrt{2xy-y^2}}$$

$$(90) \frac{\partial^2 u}{\partial x^2} = m^2 b^{mx}$$

$$(91) \frac{\partial u}{\partial x} = a^{bx} \log ax^{-1}$$

$$(92) \frac{\partial u}{\partial x} = \sin x$$

$$(93) \frac{\partial u}{\partial x} = 2x \cot^2 2x$$

$$(94) \frac{\partial u}{\partial x} = -4 \cot 2x \csc 2x$$

$$(95) \frac{u}{x} = \frac{R}{26} (\sqrt{5577} + 42)$$

$$(96) \frac{\partial^2 y}{\partial x^4} = -4y$$

$$(97) \begin{cases} x = a(\sqrt{10.15-22} + 1) \\ = \end{cases}$$

$$(98) \begin{cases} x = \frac{1}{2} (\sqrt{\frac{16a^2 + 2b^2}{3}} + b) \\ = 0 \end{cases}$$

$$(99) \frac{r}{r} = a \{ \sqrt{4 + (2n-1)^2} - (2n-1) \}$$

$$(100) \partial u = 49$$

$$(101) \partial u = 28\pi$$

$$(102) \frac{\partial^2 z}{\partial x} = \sin x$$

$$(103) \frac{\partial u}{\partial x} = x \cos x$$

$$(104) \frac{\partial u}{\partial x} = x \cos x$$

$$(105) \frac{\partial u}{\partial x} = 15 \sin^2 x \cos^2 x$$

$$(106) \frac{\partial u}{\partial x} = 2 \tan^4 x$$

$$(107) \frac{\partial y}{\partial x} = \frac{1}{2} \sqrt{\cos x + 1}$$

$$(108) \partial y = e^{\tan x} \frac{\partial x}{1+x^2}$$

$$(109) \frac{\partial u}{\partial x} = \frac{1}{a+b \cos x}$$

$$(110) \frac{\partial u}{\partial x} = \frac{x \sin x}{x^2 - 1} (x \log x + \sqrt{1-x^2} \sin^{-1} x)$$

(111)

$$4x^4 - 8cx^3 - 4b^2x^2 + 4c^2x + 4a^2x^2 + 4c^2bx - 2a^2cx$$

$$-4b^2c^2 + b^4 + 4a^2c^2 = 0$$

∴ 長 = 3寸

洋算例題續々篇卷之十卷式

微分法用ひ曲線の四線を求むる法及漸近線

(1)
$$\begin{cases} \delta T = \frac{y'}{R+x} \\ T T = \frac{Ry}{R-x} \\ R N = R-x \\ P N = R \end{cases} \quad (5) \begin{cases} y = 6\sqrt{2} \\ \delta T = 7.8 \\ \delta T = 12.5 \\ \delta T = -2.2 \end{cases}$$

(2)
$$\begin{cases} R T = \frac{2Ax - x^2}{A-x} \\ T T = \sqrt{y^2 + (\frac{2A-x}{A-x})^2 x^2} \\ R N = \frac{B^2}{A^2} (A-x) \\ P N = \sqrt{y^2 + \frac{B^4}{A^4} (A-x)^2} \end{cases} \quad (8) \delta T = -20 \frac{1}{3} \quad (9) \delta N = \frac{1}{2} (x^2 - A) \quad (10) \begin{cases} \delta T = \sqrt{\frac{2}{2x-3}} \\ \delta N = \sqrt{8xy - 7y^2} \end{cases}$$

(3)
$$\begin{cases} T R = \frac{2Ax + x^2}{A+x} \\ T T = \sqrt{y^2 + (\frac{2A+x}{A+x})^2 x^2} \\ R N = \frac{B^2}{A^2} (A+x) \\ P N = \sqrt{y^2 + \frac{B^4}{A^4} (A+x)^2} \end{cases} \quad (11) \begin{cases} A T = 0 \\ A B = -0 \end{cases} \quad (12) \begin{cases} A T = 0 \\ A B = 0 \end{cases}$$

(4)
$$\begin{cases} \delta T = -\frac{(R^2 - x^2)}{x} \\ T = \frac{R}{x} \sqrt{(R^2 - x^2)} \\ \delta N = -x \\ N = R \end{cases} \quad (12) \begin{cases} y = 0 \\ y^2 = \frac{(a+x)(b^2-x)}{x^2} \\ \delta T = -\frac{x^2 y}{(a+x)(ab^2-x^2)} \\ \delta N = -\frac{(a+x)(ab^2-x^2)}{x^2} \end{cases}$$

$$(48) \begin{cases} \text{田} = \frac{1}{2}\pi r^2 \\ \text{墨積} = \frac{1}{16}\pi r^2 \end{cases}$$

$$(49) \begin{cases} \text{墨} = \frac{2}{3}a^2 \\ \text{積} = \frac{1}{27}2a^2\pi r^2 \end{cases}$$

$$(50) \begin{cases} \text{高} = \frac{1}{2}p \\ \text{墨積} = \frac{1}{16}p^2 \end{cases}$$

$$(51) \begin{cases} \text{墨} = \frac{40}{4+\pi} = 5.6007 \\ \text{等辺} = 44 \end{cases}$$

$$(52) \text{直積} = \frac{400}{11+4\sqrt{3}} = 18.034$$

$$(53) \frac{\partial u}{\partial x \partial y} = \frac{2x}{(1-x^2+y^2)^2}$$

$$(54) \text{勾} = a(\sqrt{2}-1) = 4142$$

$$(55) \text{勾} = c\sqrt{\frac{2}{3}} = 5.7725$$

$$(56) \frac{b}{a} = \frac{1}{3}a = 1$$

$$(47) \begin{cases} a^2 + ca^2 + ce^2d - c^2 = 0 \\ \therefore d = 2.956 \end{cases}$$

$$(58) \begin{cases} \text{高} = \sqrt{\frac{ab^2}{3}} = 70 \\ \text{深} = \frac{1}{2}\sqrt{\frac{ab^2}{3}} = 35 \end{cases}$$

$$\text{容} = 171500$$

$$(59) \begin{cases} \text{墨} = \frac{2}{3}a = 2 \\ \text{長} = 13\frac{1}{3} \end{cases}$$

$$(60) \begin{cases} \text{小辺} = 2.066708 \\ \text{式} = 2x^2 - 7ax^2 - 7aby - 2a^2 = 0 \end{cases}$$

$$(61) \text{基田至} = \frac{\pi}{11}(5-\sqrt{5})$$

$$(62) \begin{cases} \text{短至} = a(\sqrt{2} \pm 2) \\ = 41.006 \end{cases}$$

$$(63) \text{截矢} = \frac{1}{2}r = 1$$

$$(64) \text{截面積} = \frac{1}{2}ar = 1$$

$$(65) b = \sqrt{\frac{2}{3}}a = 2.527 \dots$$

$$(66) v = 2(1 - \frac{x^2}{3} + \frac{x^4}{5} - \frac{x^6}{7} + \frac{x^8}{9} \pm \dots)$$

$$(67) v = 1 - \frac{1}{2}x^2 + \frac{1}{3}x^3 - \frac{1}{4}x^4 + \frac{1}{5}x^5 \pm \dots$$

$$(68) v = 1 + x + \frac{1}{2}x^2 + \frac{1}{24}x^3 + \frac{1}{240}x^4 + \dots$$

$$(69) \partial u = 62x \cdot 27 \cdot 22$$

$$(70) \frac{\partial^2 u}{\partial x \partial y} = -\frac{8xy(x^2+y^2)}{(x^2-y^2)^2}$$

$$(71) \frac{\partial^2 u}{\partial x \partial y} = 8xy^2$$

$$(72) \partial u = \frac{x^2}{y^2}(572x - 2x^2y)$$

$$(73) \frac{\partial^2 u}{\partial x \partial y} = \frac{-2}{(y-x^2)^2}$$

$$(74) \frac{\partial^2 u}{\partial x \partial y} = \frac{4xz}{(a^2 - 2xy)}$$

$$(76) \frac{\partial^2 z}{\partial x \partial y} = \cos x + \cos y$$

$$(75) w = x^y(\frac{y}{x} \partial x + \log y \partial y)$$

$$(77) \frac{\partial^2 u}{\partial x \partial y} = \frac{2x}{(1-x^2+y^2)^2}$$

$$(78) \begin{cases} \text{廣} = \frac{1}{2}a = 2 \\ \text{長} = 10 \end{cases}$$

$$(79) \frac{\partial^2 z}{\partial x^2} = \frac{4a^3}{(a^2+x^2)^2}$$

$$(80) \begin{cases} \text{黄木綿} = \frac{y}{b-a}(\sqrt{ab}-a) \\ = 7 \text{ 反} \end{cases}$$

$$\text{白木綿} = 8 \text{ 反}$$

$$\begin{cases} \text{柳本ヲル} \\ \text{也價得式} = \frac{1}{2}(\sqrt{\frac{ab}{2}}+a) \\ = 5 \text{ 文} \end{cases}$$

$$(81) \text{同本数} = 20 \text{ 本}$$

$$\text{樺本} = 10 \text{ 文}$$

$$\text{同本数} = 4 \text{ 本}$$

$$(82) \begin{cases} a \text{ 入頁} = 18750 \text{ 入} \\ b \text{ 入頁} = 12500 \text{ 入} \end{cases}$$

$$(83) \frac{\partial u}{\partial x} = \frac{x \log x}{(1+x)^2}$$

$$(84) \frac{\partial u}{\partial x} = \frac{x \log x}{(1+x)^2}$$

$$(84) \frac{\partial u}{\partial x} = 2 \sin^2 x$$

$$(85) \frac{\partial u}{\partial x} = \frac{u \cos x - \sin u}{x \cos x - \sin x}$$

$$(86) \frac{\partial u}{\partial x} = \sin^2 x$$

$$(87) \frac{\partial u}{\partial x} = \frac{e^u}{2-u}$$

$$(88) \frac{\partial u}{\partial x} = -\frac{1}{x(1+x)}$$

$$(89) \frac{\partial u}{\partial x} = \sin 2x$$

洋算例題續五篇卷之七卷式

混淆問題之部

- (1) $\frac{\partial u}{\partial x^n} = \sin(x + n \frac{\pi}{2})$ (15) $\frac{\partial u}{\partial x} = \sin^2 x (2 - \sin x)$
 (2) $\frac{\partial u}{\partial x} = n \cos x \sin^{n-1} x$ (16) $\frac{\partial u}{\partial x} = \frac{\sin x (2 + \cos x)}{\cos^2 x}$
 (3) $\frac{\partial u}{\partial x} = \frac{1}{\sqrt{a^2 - x^2}}$ (17) $\frac{\partial u}{\partial x} = e^x (\cos x - \sin x)$
 (4) $\frac{\partial u}{\partial x} = \frac{1}{\sqrt{a^2 - x^2}}$ (18) $\frac{\partial u}{\partial x} = \frac{1}{1+x^2}$
 (5) $\frac{\partial u}{\partial x} = 2 \cos 2x$ (19) $\frac{\partial u}{\partial x} = \frac{3}{\sqrt{1-x^2}}$
 (6) $\frac{\partial u}{\partial x} = -\cos(ax+b)$ (20) $\frac{\partial u}{\partial x} = \frac{2}{\sqrt{1-x^2}}$
 (7) $\frac{\partial u}{\partial x} = \frac{1}{x \log x}$ (21) $\frac{\partial u}{\partial x} = \frac{2}{1+x^2}$
 (8) $\frac{\partial u}{\partial x} = \frac{u+a^2+x^2}{x(1-2ax)}$ (22) $\frac{\partial u}{\partial x} = \frac{1}{\sqrt{x(1-x)}}$
 (9) $\frac{\partial u}{\partial x} = \frac{u}{x}$ (23) $\frac{\partial u}{\partial x} = \cos 2x$
 (10) $\frac{\partial u}{\partial x} = \frac{u}{x}$ (24) $\frac{\partial u}{\partial x} = (\sin x)^2 (\log \sin x + x \cot x)$
 (11) $x = \frac{3}{4} b$ (25) $\frac{\partial u}{\partial x} = \frac{1}{-2(1+x^2)}$
 (12) $\frac{\partial u}{\partial x} = \sin 2x$ (26) $\frac{\partial u}{\partial x} = \cot 2x$
 (13) $\frac{\partial u}{\partial x} = \sqrt{-1}$ (27) $\frac{\partial u}{\partial x} = \sqrt{2a^2 - u^2}$
 (14) $\frac{\partial u}{\partial x} = x^2 e^x$ (28) $\frac{\partial u}{\partial x} = \frac{1}{x} \cos(\log x)$

- (29) $\frac{\partial u}{\partial x} = \frac{1}{1-x^2}$ (41) 玄天差 = $d(\frac{1}{2}\sqrt{5} \pm 0.5)$
 (30) $\frac{\partial u}{\partial x} = \frac{1}{\sin^2 x \cos^2 x}$ (42) $\begin{cases} \text{長} = \frac{1}{4} \sqrt{5} = 0 \\ \text{橫} = \frac{1}{5} \sqrt{5} = 1 \\ \text{積} = 0 \end{cases}$
 (31) $\frac{\partial u}{\partial x} = \frac{2}{\sqrt{1-x^2}}$
 (32) $\frac{\partial u}{\partial x} = \frac{2x^{\frac{3}{2}}}{x(1-x^{\frac{3}{2}})}$ $\begin{cases} \text{深} = \frac{1}{6}(3d+8\sqrt{d} \pm \sqrt{4d^2-3d^2}) \\ \text{寬} = 5.88 \end{cases}$
 (33) $\frac{\partial^2 u}{\partial x^2} = \frac{1.2}{x}$
 (34) $\frac{\partial^3 u}{\partial x^3} = \frac{1.2.3}{x}$ (43) $\begin{cases} \text{橫} = 4.41 \\ \text{深} = 2.52 \\ \text{寬} = 10.05 \end{cases}$
 (35)
 (36) $x = \frac{1}{2} \pi$
 (37) $\begin{cases} \gamma = \frac{1}{\pi} a \\ \beta = \frac{2}{\pi} a^2 \end{cases}$ (44) 呈 = $a\sqrt{2(5\sqrt{5}-1)}$
 (38)
 (39) $a = \frac{c}{2}(\sqrt{15}-1)$ (45) 呈 = $\frac{1}{2\pi} \beta = 0.6266 \dots$
 (40) $\left\{ \begin{array}{l} \text{長} = \frac{b}{2} = 4 \\ \text{橫} = \frac{a}{2} = 3 \end{array} \right\}$ (47) $\begin{cases} \text{BD} = \sqrt{2(a^2-b^2)} - \sqrt{2} \\ \text{寬} = 35.95417771 \dots \\ \text{總田地} = 8275.1188 \\ \text{及取坪} \end{cases}$

洋算例題續 五篇卷之六 答式

多元極數術之部

(1) $\begin{cases} x = \frac{1}{2}a \\ y = \frac{1}{3}a \end{cases}$

(2) $x = y = a$

(3) $\begin{cases} x = -\sqrt{2} \\ y = \sqrt{2} \end{cases}$

(4) $x = y = 0$

(5) $x = y$

(6) $\begin{cases} x = \frac{2a}{b^2} \\ y = \frac{2a^2}{2b^2} \end{cases}$

(7) $\begin{cases} x = \frac{2a}{4} \\ y = \frac{-27a^4}{512} \end{cases}$

(8) $\begin{cases} \text{對角和二百} \\ \text{六十度故} \\ \text{四角形所面} \\ \text{四角形以極大} \\ \text{其底在} \end{cases}$

$\sin(B+D) = 0$
 $\therefore B+D = 180^\circ \text{ or } 0^\circ$

(9) $\begin{cases} x = \frac{a\sqrt{2}}{\sqrt{1+\sqrt{2}}} \\ y = \frac{a}{\sqrt{1+\sqrt{2}}} \\ \therefore \tan \varphi = \frac{1}{\sqrt{2}} = \sqrt{0.5} \\ \therefore 2\varphi = 83^\circ 23' 44''.16 \end{cases}$

(10) $\begin{cases} x = y \text{ 故} = \text{底} \\ \text{半邊以深} \end{cases}$

(11) $\begin{cases} AP = \frac{1}{2}\sqrt{2b^2+2c^2-a^2} \\ \text{故} = \text{斜邊} \text{ 平分斜邊} \\ \text{交於所} \end{cases}$

(12) $\begin{cases} x = y = 60^\circ \text{ 故} = \\ \text{等邊三角形} \end{cases}$

(13) $\begin{cases} x = \frac{a}{\sqrt{a^2+b^2+c^2}} \\ y = \frac{b}{\sqrt{a^2+b^2+c^2}} \\ z = \frac{c}{\sqrt{a^2+b^2+c^2}} \end{cases}$

(14) $x = \frac{\log A(c) - 2\log a}{2\log a}$

洋算例題續 五篇卷之六 下答式

消去法之部

(1) $\frac{1}{x} \frac{\partial y}{\partial x} - \frac{\partial^2 y}{\partial x^2} = 0$ (15)

(2) $(y - x \frac{\partial y}{\partial x})^2 + \frac{\partial^2 y}{\partial x^2} x^2 y = 0$ $\frac{\partial^2 y}{\partial x^2} + x^2 y = 0$

(3) $xy + 5 \frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial x^4} = 0$ (16)

(4) $4 \frac{\partial^2 y}{\partial x^2} - \frac{\partial^2 y}{\partial x^2} - 12y = 0$ $\frac{\partial^2 y}{\partial x^2} + \frac{y}{x^2} + \frac{1}{x} \frac{\partial y}{\partial x} = 0$

(5) $\frac{\partial^2 y}{\partial x^2} = my + (x-mx)x^{n-1}$ (17)

(6) $\frac{\partial^2 y}{\partial x^2} = \frac{\partial y}{\partial x}$ $\frac{\partial^2 y}{\partial x^2} = 1 - y^2$

(7) $\frac{\partial^2 y}{\partial x^2} y + (\frac{\partial y}{\partial x})^2 = 0$ (18)

(8) $a + (\frac{\partial^2 y}{\partial x^2})^2 x - (\frac{\partial y}{\partial x})^2 y = 0$ $= \frac{2}{1+y^m} (y+mx)^{m-1}$

(9) $a^2 \frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial x^2} = 0$ (19)

(10) $x \frac{\partial^2 z}{\partial x^2} + y \frac{\partial^2 z}{\partial y^2} + 2 = 0$ $\frac{y}{x} \frac{\partial z}{\partial y} + \frac{\partial z}{\partial x} + \frac{z}{x} = 0$

(11) $y \frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial x^2} - \frac{y}{x} \frac{\partial y}{\partial x} = 0$ (20)

(12) $\frac{\partial^2 y}{\partial x^2} + \frac{y^2+y+1}{x^2+x+1} = 0$ $\frac{\partial^2 y}{\partial x^2} \frac{\partial^2 z}{\partial x^2} =$

(13) $\frac{\partial^2 y}{\partial x^2} + m^2 y = 0$ $-\frac{\partial^2 z}{\partial x^2} \frac{\partial^2 y}{\partial x^2} = 0$

(14) $\frac{\partial^2 y}{\partial x^2} - \frac{1}{2} \frac{\partial^2 y}{\partial x^2} - y = 0$

$$(57) \frac{0}{0} = \frac{1}{2}$$

$$(58) \frac{0}{0} = \frac{1}{3}$$

$$(59) \frac{-\infty}{\infty} = 1$$

$$(60) 0^0 = 1$$

$$(61) \infty^\infty = 1 = e$$

$$(62) 1^\infty = e^m$$

$$(63) \frac{0}{0} = 1 = -\log l = \frac{1}{e}$$

$$(64) \frac{0}{0} = 1$$

$$(65) \frac{0}{0} = \frac{-n(n+1)}{2}$$

$$(67) \frac{0}{0} = \frac{1}{2}$$

$$(68) \frac{0}{0} = \frac{1}{2}$$

$$(68) \frac{0}{0} = \frac{1}{6}$$

$$(69) \frac{0}{0} = 2$$

$$(70) \frac{0}{0} = -1$$

$$(71) 0 \times \infty = \frac{2}{\pi}$$

$$(72) 0 \times \infty = 0$$

$$(73) \frac{0}{0} = \frac{16a}{9}$$

$$(74) \frac{0}{0} = \frac{1}{2}$$

$$(75) \frac{0}{0} = 1$$

$$(76) \frac{0}{0} = \frac{1}{10}$$

$$(77) \frac{0}{0} = -1$$

$$(78) \frac{0}{0} = -5a$$

$$(79) \frac{0}{0} = \frac{1}{2}$$

$$(80) \frac{0}{0} = \log -1 = \log \left(\frac{a}{e} \right)$$

$$(81) \frac{0}{0} = \frac{\pi^2}{8}$$

$$(82) \frac{0}{0} = 1$$

$$(82) \text{證+故之畧式リ=ナス}$$

$$(84) \frac{\infty}{\infty} = 1$$

$$(85) \frac{0}{0} = \frac{1}{1+\sqrt{2}}$$

$$(86) \frac{0}{0} = 1$$

$$(87) \frac{0}{0} = \frac{2a}{\pi}$$

$$(88) \frac{0}{0} = 0$$

洋算例題續五篇卷之五拾式

極數術之部

$$(1) \begin{cases} r = 6 \\ 2y = 16\sqrt{\frac{1}{2}} \\ = 9.22760426 \dots \end{cases}$$

$$(2) \begin{cases} x = \frac{2}{3}a \\ r = \frac{1}{4}a \end{cases}$$

$$(3) \text{勺一服} = \frac{2}{\sqrt{2}}$$

$$(4) x = e$$

$$(5) r = r = \sqrt{\frac{r}{\pi}}$$

$$(6) x = \frac{2}{3}r$$

$$(7) \text{勺一服} = r\sqrt{2}$$

$$(8) \text{幅一壘} = r\sqrt{2}$$

$$(9) \begin{cases} r = \sqrt{\frac{r}{\pi}} \\ r = \sqrt{\frac{r}{\pi}} \end{cases}$$

$$(10) x = 4.534 \dots$$

洋算例題續及篇卷之四卷式

消失分數之部

- | | |
|---|---|
| (1) $\frac{0}{0} = \frac{1}{2a}$ | (15) $\frac{0}{0} = \frac{1}{\sqrt{2a}}$ |
| (2) $\frac{\sqrt{2a}}{1+a\sqrt{a}}$ | (16) $\frac{1}{\infty} = 0$ |
| (3) $\frac{0}{0} = \frac{3}{2}$ | (17) $\frac{0}{0} = \frac{\pi}{2p}$ |
| (4) $\frac{0}{0} = 1$ | (18) $\frac{0}{0} = 4$ |
| (5) $\frac{0}{0} = \infty$ | (19) $\frac{0}{0} = 2$ |
| (6) $\frac{0}{0} = m$ | (20) $\frac{0}{0} = \frac{\pi^2}{6}$ |
| (7) $\frac{0}{0} = \frac{m^2-1}{\pi^2-1}$ | (21) $\frac{0}{0} = \log 1 = \log \left(\frac{a}{b}\right)$ |
| (8) $\frac{0}{0} = \frac{1}{3}$ | (22) $\frac{0}{0} = 1$ |
| (9) $\frac{0}{0} = \frac{a}{b}$ | (23) $\frac{0}{0} = 1$ |
| (10) $\frac{0}{0} = 2a$ | (24) $\frac{\infty}{\infty} = 0$ |
| (11) $\frac{0}{0} = 0$ | (25) $\frac{0}{0} = 2$ |
| (12) $\frac{0}{-10} = 0$ | (26) $\frac{\infty}{\infty} = 0$ |
| (13) $\frac{0}{0} = 1$ | (27) $\frac{\infty}{\infty} = \frac{\pi^2}{8}$ |
| (14) $\frac{0}{0} = -1$ | (28) $\frac{\infty}{\infty} = 1$ |

- | | |
|---|--|
| (29) $\frac{0}{0} = \frac{2}{\pi a^{n-2}}$ | (40) $\frac{0}{0} = 0$ |
| (30) $\frac{0}{0} = -\frac{2}{\pi}$ | (41) $\frac{0}{0} = \frac{m}{\pi}$ |
| (31) $\frac{0}{0} = m e^{am}$ | (42) $\frac{0}{0} = e^a$ |
| (32) e^n | (43) $\frac{0}{0} = \log \left(\frac{a}{b}\right)$ |
| (33) $\frac{0}{0} = 2$ | (44) $\frac{0}{0} = 2$ |
| (34) 證+故畧式' = 之 | (45) $\frac{0}{0} = \frac{1}{6}$ |
| (35) $\frac{0}{0} = -\frac{1}{6}$ | (46) $\frac{0}{0} = 3$ |
| (36) $\frac{0}{0} = 4$ | (47) $\frac{0}{0} = -2$ |
| (37) $\frac{\infty}{\infty} = \frac{1}{\infty} = 0$ | (48) $\frac{\infty}{\infty} = -1$ |
| (38) $\frac{0}{0} = -1$ | (49) $\frac{0}{0} = \frac{B^2-d^2}{b^2-a^2}$ |
| (39) a, a_2, a_3, \dots, a_n | (50) $\frac{1}{2}$ |
| (40) $\frac{0}{0} = 0$ | (51) $\frac{\infty}{\infty} = \frac{0}{1} = 0$ |
| (41) $\frac{0}{\infty} = a$ $\frac{0}{\infty} = 0$ | (52) $\frac{\infty}{\infty} = 0$ |
| (42) $\frac{0}{0} = \frac{2}{\pi^2}$ | (53) $\frac{0}{0} = \frac{1}{3}$ |

$$(27) \frac{\partial u}{\partial x} = \frac{e^x - e^{-x}}{e^x + e^{-x}} \quad (28) \frac{\partial u}{\partial x} = a \left(\frac{x}{a}\right)^{ax} \left(\frac{y}{a} + 1\right)$$

$$(29) \frac{\partial u}{\partial x} = x^x x^{n-1} (n \log x + 1)$$

$$(30) \frac{\partial u}{\partial x} = x^x x^x \left\{ \frac{1}{x} + \log x \cdot \log x \right\}$$

$$(31) \frac{\partial u}{\partial x} = \frac{4}{(e^x + e^{-x})^2} \quad (32) \frac{\partial u}{\partial x} = e^x (1 - 2x^e - e^e)$$

世間り五マノ式ヲス
三ニ世向テ證之畧

$$(33) 0,000252$$

$$(34) 0,000286$$

$$(35) 0,000142$$

$$(36) 0,000047$$

$$(37) -0,000264$$

$$() -0,000167$$

$$() -0,000088$$

$$() 0,00070$$

$$() 0,00154$$

$$() -0,00215$$

$$() -0,00088$$

$$() 0,0000055$$

四八七ノ條證之畧
十及四九兩ノ解ヲス

$$(51) 0,000689$$

$$(52) 0,000027$$

$$(53) -0,00005$$

$$(54) -0,0000042$$

$$(55) -0,000242$$

$$(56) 0,000689$$

$$(58) 0,000012$$

$$(57) \frac{\partial z}{\partial x} = -\frac{x \frac{\partial y}{\partial x}}{\sqrt{x^2 - y^2}}$$

$$(58) \frac{\partial z}{\partial x} = \frac{x^2 \frac{\partial t}{\partial x}}{x^2 + t^2}$$

$$(59) \frac{\partial z}{\partial x} = \frac{x \frac{\partial x}{\partial x}}{\sqrt{(2x-x)x}}$$

$$\text{or } t = \sin z$$

$$\text{or } x = \sin z$$

$$(60) \frac{\partial y}{\partial x} = \frac{2x}{\sqrt{2}}$$

$$(61) \frac{\partial y}{\partial x} = 5$$

$$(45) 0,000122$$

$$(46) 0,00000001375$$

$$(47) 0,00007$$

$$(48) 0,0002755$$

$$(49) 0,0002868$$

$$(50) 0,0012908$$

十一 $y = \frac{x}{a} - \frac{x^2}{a^2} + \frac{x^3}{a^3} - \frac{x^4}{a^4} \pm$

十二 $y = a + \frac{x}{5} - \frac{4x^2}{2.5^2 a} + \frac{49x^3}{2.5^3 a^2} - \frac{4974x^4}{2.5^4 a^3} +$

十三 $y = 1 - x + x^2 - x^3 + x^4 \pm$

十四 $y = a^{\frac{1}{2}} + \frac{1}{2} a^{-\frac{1}{2}} x - \frac{1}{2.4} a^{-\frac{3}{2}} x^2 + \frac{1}{2.4.6} a^{-\frac{5}{2}} x^3 \pm$

十五 $y = a^{-2} - 2a^{-3} x + 3a^{-4} x^2 - 4a^{-5} x^3 + 5a^{-6} x^4 \pm$

十六 $y = a^{-3} - 3a^{-4} x + 2.3a^{-5} x^2 - 2.5a^{-6} x^3 + 3.5a^{-7} x^4 \pm$

十七 $y = b^{-1} + \frac{1}{2} b^{-2} x^2 + \frac{3}{2.4} b^{-5} + \frac{3.5}{2.4.6} b^{-4} x^6 +$

十八 $y = a^{\frac{10}{3}} + \frac{5}{3} a^{\frac{4}{3}} x^2 + \frac{5.3}{2.6} a^{\frac{2}{3}} x^4 + \frac{5.2.1}{2.6.9} a^{-\frac{4}{3}} x^6 +$

十九 $y = \frac{1}{a} - \frac{x^4}{4a^5} + \frac{5x^8}{48a^9} - \frac{59x^{12}}{4.8.12a^{13}} + \frac{5.9.13x^{16}}{4.8.12.16a^{17}} \pm$

二十 $u = x^{\frac{1}{2}} + \frac{1}{2} x^{-\frac{1}{2}} y - \frac{1}{2.4} x^{-\frac{3}{2}} y^2 + \frac{3}{2.4.6} x^{-\frac{5}{2}} y^3 -$

廿一 $u = x^{\frac{1}{3}} + \frac{1}{3} x^{-\frac{2}{3}} y - \frac{2}{3.6} x^{-\frac{5}{3}} y^2 + \frac{2.5}{3.6.9} x^{-\frac{8}{3}} y^3 -$

廿二 $u = x^n + nx^{n-1}y + \frac{n(n-1)}{1.2} x^{n-2}y^2 + \frac{n(n-1)(n-2)}{1.2.3} x^{n-3}y^3 + \frac{n(n-1)(n-2)(n-3)}{1.2.3.4} x^{n-4}y^4 +$

廿三 $\frac{\partial u}{\partial x} = 74$ 廿四 $\frac{\partial u}{\partial y} = -7$

廿五 $\frac{\partial u}{\partial x} = 21x$ 廿六 $\frac{\partial u}{\partial y} = 5x$

洋美例題續々篇卷之三卷式

(1) 0,000045 (2) 0,000075

(3) 0,000774 (7) $\frac{\partial y}{\partial x} = \frac{2ax}{a^2-x^2}$

(4) $\frac{\partial y}{\partial x} = \frac{a^{2x}}{x(a^2+x^2)}$ (8) $\frac{\partial y}{\partial x} = \frac{2a^x \log a}{(a^x+1)^2}$

(9) $\frac{\partial y}{\partial x} = \left(\frac{a}{x}\right)^x \left\{ \log\left(\frac{a}{x}\right) - 1 \right\} x$

(10) $\frac{\partial u}{\partial x} = \frac{1}{\sqrt{2x+x^2}}$ (11) $\frac{\partial u}{\partial x} = -\frac{2}{\sqrt{x^2+1}}$

(12) $\frac{\partial u}{\partial x} = \frac{1}{x} - \frac{1}{\sqrt{x^2+1}}$ (13) $\frac{\partial u}{\partial x} = -n(\log x)^{n-1} \frac{1}{x}$

(14) $\frac{\partial u}{\partial x} = x^x(1+\log x)$ (15) $\frac{\partial u}{\partial x} = 1+\log x$

(16) $\frac{\partial u}{\partial x} = \frac{1}{\sqrt{x^2+a^2}}$ (17) $\frac{\partial u}{\partial x} = \frac{1-\log x}{x^2}$

(18) $\frac{\partial u}{\partial x} = \frac{1}{\sqrt{1+x^2}}$ (19) $\frac{\partial u}{\partial x} = \frac{a}{x\sqrt{a^2+x^2}}$

(20) $\frac{\partial u}{\partial x} = \frac{\log x - 1}{(\log x)^2}$ (21) $\frac{\partial u}{\partial x} = x^2(\log x)^2$

(22) $\frac{\partial u}{\partial x} = \frac{-a}{x\sqrt{a^2-x^2}}$ (23) $\frac{\partial u}{\partial x} = \frac{\sqrt{a}}{(a-x)\sqrt{x}}$

(24) $\frac{\partial u}{\partial x} = \frac{2x^2}{x^3-1}$ (25) $\frac{\partial u}{\partial x} = \frac{x^{\frac{1}{2}} \log(\frac{1}{x})}{x^2}$

(26) $\frac{\partial u}{\partial x} = \frac{x}{x^2+6x^2+11x+6}$

(27) $\frac{\partial u}{\partial x} = \frac{-\sqrt{a^2-x^2}}{x}$ (28) $\frac{\partial u}{\partial x} = \frac{-\sqrt{a^2-x^2}}{x}$

洋算例題續々篇卷之二

$$\text{例一} \begin{cases} \frac{\partial y}{\partial x} = 4ax^3 & \frac{\partial^2 y}{\partial x^2} = 12ax^2 \\ \frac{\partial^3 y}{\partial x^3} = 24ax & \frac{\partial^4 y}{\partial x^4} = 24a \end{cases}$$

$$\text{例二} \begin{cases} \frac{\partial y}{\partial x} = 2ax + 2bx^2 + 4cx^3 & \frac{\partial^2 y}{\partial x^2} = 2b + 12cx^2 \\ \frac{\partial^3 y}{\partial x^3} = 2a + 6ax + 12cx^2 & \frac{\partial^4 y}{\partial x^4} = 24c \end{cases}$$

$$\text{例三} \begin{cases} \frac{\partial y}{\partial x} = 4x^2 + 3x^2 + 2x + 1 & \frac{\partial^2 y}{\partial x^2} = 24x + 6 \\ \frac{\partial^3 y}{\partial x^3} = 12x + 6 & \frac{\partial^4 y}{\partial x^4} = 24 \end{cases}$$

$$\text{例四} \frac{\partial^n y}{\partial x^n} = (-1)^n 2 \cdot 2 \cdot 2 \cdot 5 \cdots \cdots x x^{-n-1}$$

$$\text{例五} \frac{\partial^2 y}{\partial x^2} = \frac{24}{(1-x)^5} \quad \frac{\partial^3 y}{\partial x^3} = \frac{6}{(1-x)^4}$$

$$\text{例六} \frac{\partial^2 y}{\partial x^2} = \frac{3a^2}{4\sqrt{x(x-a)^3}}$$

$$\text{例七} \begin{cases} \frac{\partial y}{\partial x} = 4(x+a)^3 & \frac{\partial^2 y}{\partial x^2} = 12(x+a)^2 \\ \frac{\partial^3 y}{\partial x^3} = 24(x+a) & \frac{\partial^4 y}{\partial x^4} = 24 \end{cases}$$

$$\text{例八} y = a^2 + na^{n-1}x + \frac{n(n-1)}{1 \cdot 2} a^{n-2}x^2 + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} a^{n-3}x^3 + \cdots$$

$$\text{例九} u = \sqrt{1 - x - \frac{x^2}{2} - \frac{x^3}{2} \cdots \cdots}$$

$$\text{例十} u = a + \frac{x^2}{2a} - \frac{x^4}{24a^3} + \frac{22x^6}{240a^5} \cdots \cdots$$

