

一、填充題

(1)	(2)	(3)	(4)	(5)	(6)
20	$5\sqrt{3}$	$\sqrt{3}$	$\frac{1}{2} \leq k \leq 3$	$(\frac{8}{5}, \frac{21}{5})$	(1,1)
(7)	(8)	(9)	(10)	(11)	(12)
$(\frac{1}{2}, \frac{1}{2})$	$(1, \sqrt{6}, \sqrt{2})$	15	$\frac{1}{4}$	90	3
(13)	(14)	(15)	(16)	(17)	(18)
$4\pi^2$	$8\pi^2$	or does not (∞) exist	2π	1	$-\frac{1}{3}$

二、計算證明題

1. (1) $0 < x \leq 1$

如圖所示面積為無限大

(2)

$$\textcircled{1} \lim_{x \rightarrow \infty} \int_1^x \frac{1}{x} dx = \lim_{x \rightarrow \infty} \ln x = \ln x$$

$$= \infty$$

or $\ln 2 > \frac{1}{2}$

$$\ln 2^n = n \ln 2 > n \cdot \frac{1}{2}$$

$$\therefore \lim_{x \rightarrow \infty} \ln x > \lim_{x \rightarrow \infty} \frac{1}{2} = \infty$$

(3)

(1) $x > 1$

如圖所示面積

(2)

$$\textcircled{2} \lim_{x \rightarrow 0^+} \ln x = \lim_{x \rightarrow 0^+} \ln \frac{1}{x}$$

$$= \lim_{x \rightarrow 0^+} -\ln x = -\infty$$

2. (1) 收斂
(字比級數之比值 < 1)

(2) 發散
(與 $\frac{1}{n}$ 比較, 可用 comparison test 求符)

(3) 發散
(用 ratio test 求符 $|\frac{a_{n+1}}{a_n}| > 1$)