SVAR TILL UPPGIFTER

KAPITEL 16

1601. $\frac{1}{9}-\frac{2}{27}(x-3)+\frac{1}{27}(x-3)^2-\frac{4}{243}(x-3)^3+5\frac{1}{c^6}(x-3)^4$ där $c \in]3,x[$ resp. $]x,3[$

1602. $1+2\left(x-\frac{\pi}{4}\right)+(\tan c+\tan^3 c)\left(x-\frac{\pi}{4}\right)^2$, $0.965<\tan 44^\circ<0.966$

1603. $\frac{1}{\sqrt{2}}\left\{1+x-\frac{\pi}{4}-\frac{1}{2}\left(x-\frac{\pi}{4}\right)^2-\frac{1}{6}\left(x-\frac{\pi}{4}\right)^3\right\}+\frac{\sin c}{24}\left(x-\frac{\pi}{4}\right)^4$,
felet $<\frac{\pi^4}{6144}<\frac{1}{60}<0.017$

1605. a) maximipunkt b) nej c) maximipunkt d) nej
e) minimipunkt

1606. $\sinh x = x+\frac{x^3}{3!}+\ldots+\frac{x^{2n-1}}{(2n-1)!}+\frac{x^{2n+1}}{(2n+1)!}\cosh c$

$\cosh x = 1+\frac{x^2}{2!}+\ldots+\frac{x^{2n-2}}{(2n-2)!}+\frac{x^{2n}}{(2n)!}\cosh c$

1607. Felens absolutbelopp är $<0.000\,111$ resp. $0.000\,003$

1608. a) 0.95 b) 0.856

1609. a) 0.017 b) 0.156

1610. 0.454 (Utveckla kring $\pi/3$)

1611. a) 0.635 b) 0.929 c) 0.961 d) 0.877

1612. a) $y\approx 2+5(x-1)+11(x-1)^2+\frac{70}{3}(x-1)^3$

b) $y\approx 1+1.29\left(x-\frac{\pi}{6}\right)+0.75\left(x-\frac{\pi}{6}\right)^2-0.10\left(x-\frac{\pi}{6}\right)^3$

1615. Resttermen blir $\frac{(-1)^n x^{n+1}}{(n+1)(1+\theta_1 x)^{n+1}}$, $0<\theta_1<1$

1616. $0.095\,310$

1617. $0.693\,13<\ln 2<0.693\,15$

1618. a) 0.693 b) $2.302\,4<\ln 10<2.302\,7$

1619. a) $1+x^2+\frac{x^4}{2!}+\frac{x^6}{3!}+\frac{x^8}{4!}e^{\theta x^2}$

b) $1-\frac{x}{2!}+\frac{x^2}{4!}-\frac{x^3}{6!}+\frac{x^4}{8!}-\frac{x^5}{10!}+\frac{x^6}{12!}-\frac{x^7}{14!}\cos\theta\sqrt{x}$ då $x\geq 0$

c) $\frac{x^2}{2}-\frac{x^6}{2^3(3!)}+\frac{x^{10}}{2^5(5!)}\cos\theta\frac{x^2}{2}$ d) $-\frac{x^2}{2}-\frac{x^4}{2^2\cdot 2}-\frac{x^6}{2^3\cdot 3}-\frac{x^8}{2^4\cdot 4}\frac{1}{1-\theta\frac{x^2}{2}}$

e) $x^4+\frac{x^8}{4!}(e^{\theta_1 x^2}+\cos\theta_2 x)$

1620. a) 0 b) 12 c) 0 för udda n, $(2k)!/k!$ för $n = 2k$

1622. Maclaurinutvecklingarna är lika så när som på resttermerna.

1623. 0.099 669

1624. $-\frac{x}{3} + (1+3^{-4})x^3 - \frac{x^5}{5 \cdot 3^5} + \frac{x^7}{7 \cdot 3^7} - (1+3^{-10})\frac{x^9}{3} + R_{11}(x)$

1625. 3.141 59

1627. a) $1 + \frac{x}{3} - \frac{x^2}{9} + \frac{5x^3}{81(1+c)^{8/3}}$

b) 2.080 (Skriv $\sqrt[3]{9} = \sqrt[3]{8}\sqrt[3]{1.125} = 2\sqrt[3]{1.125}$)

1628. a) $1 + x + x^2 + \ldots + x^{n-1} + \frac{x^n}{(1-c)^{n+1}}$ b) $c = 1 - (1-x)^{1/(n+1)}$

1629. $2 + \frac{x-16}{32} - \frac{3(x-16)^2}{4096} + \frac{7(x-16)^3}{128}c^{-11/4}$, $|c - 16| < |x - 16|$

2.030 51; $\sqrt[4]{17} < 2.030\,55$

1630. 2.012 35

1632. a) $1 - \frac{x}{2} - \frac{x^2}{8} - \frac{x^3}{16} - \frac{5x^4}{128} + R_5(x)$ b) $1 + \frac{x}{4} - \frac{3x^2}{32} + \frac{7x^3}{128} + R_4(x)$

c) $x - \frac{x^3}{6} + \frac{3x^5}{40} + R_7(x)$

1633. 0.996 5

1635. a) $\frac{5}{6} + \frac{13x}{36} + \frac{35x^2}{216} + O(x^3)$ b) $x - x^2 + \frac{x^3}{3} + O(x^4)$

c) $1 + \frac{x^2}{2} + \frac{x^4}{24} - \frac{31x^6}{720} + O(x^8)$ d) $1 - x + \frac{x^2}{2} - \frac{x^3}{2} + \frac{3x^4}{8} + O(x^5)$

e) $e\left(1 - \frac{x^2}{2} + \frac{x^4}{6}\right) + O(x^6)$ f) $1 - \frac{x^2}{4} - \frac{x^4}{96} + O(x^6)$

g) $1 + \frac{x^2}{6} + \frac{7x^4}{360} + O(x^6)$ h) $e\left(1 - \frac{x}{2} + \frac{11x^2}{24}\right) + O(x^3)$

1636. a) 1/12 b) −1/2 c) 1/3 d) 7/360 e) −1/10 f) $1/\sqrt{e}$

1637. a) 1 b) 1 c) $e^{-1/3}$

1638. $\frac{1-a}{1-b}$ om $b \neq 1$, 1 om $a = b = 1$

1639. $a = -1$, $b = 1/3$, gränsv. $= -1/45$

1640. a) −1/18 b) 1/10

1641. $-e/2$

1642. a) $\ln \frac{a}{b}$ b) $-1/2$ c) 2 d) $-1/2$

1643. a) a^2/b^2 b) 1 c) 1 d) e e) e^a f) $1/\sqrt{d}$

1644. a) 1 b) $1/2$

KAPITEL 17

1701. a) Konv.; $-4/3$ b) div. c) konv.; 0

1702. 2^k

1704. a) Konv.; 0 b) div. c) konv.; 1

1705. b) 0 i alla tre fallen

1706. a) $2 \cdot 7^n$ b) $6 \cdot 2^n - 1$ c) $4 - (1/2)^n$ d) $\frac{1}{2}(1 + (-1)^n)$
e) $\frac{1}{2}(3^{n+1} + 1)$ f) $1 + (-1/2)^n$

1707. a) $(e^n - 1)/(e - 1)$ b) $\sin \frac{n}{2} \cdot \sin \frac{n-1}{2} / \sin \frac{1}{2}$

c) $\sum_{k=0}^{n-1} k \cdot 2^{n-1-k} = 2^n - n - 1$

d) $(-1)^n + \sum_{k=o}^{n-1} (-1)^{n-1-k}(3k - 2) = \frac{1}{4}(6n + 11(-1)^n - 7)$

e) $2 + \sum_{k=0}^{n-1} (k+1)^2 = \frac{1}{3}n^3 + \frac{1}{2}n^2 + \frac{1}{6}n + 2$

1708. a) $S_{n+1} = (1 + 0.01p)S_n - A_{n+1}$ då $n \geq 0,\ S_0 = K$

b) $S_n = \left(K - \frac{100A}{p}\right)(1 + 0.01p)^n + \frac{100A}{p},\ A = \frac{0.01p(1 + 0.01p)^N K}{(1 + 0.01p)^N - 1}$

c) $S_n = \left(K - \frac{100A}{p - r}\right)(1 + 0.01p)^n + \frac{100A}{p - r}(1 + 0.01r)^n$ och

$A = \frac{0.01(p - r)K(1 + 0.01p)^N}{(1 + 0.01p)^N - (1 + 0.01r)^N}$ då $r \neq p$; $S_n = \left(K - \frac{nA}{1 + 0.01p}\right)(1 + 0.01p)^n$

och $A = \frac{(1 + 0.01p)^K}{N}$ om $r = p$

1709. a) $C_1 \cdot 2^n + C_2 \cdot (-3)^n$ b) $C_1 \cdot 2^n + C_2 \cdot 5^n$ c) $(C_1 + C_2 n) \cdot 2^n$

d) $(C_1 + C_2 n)(-1/3)^n$ e) $2^{n/2}\left(C_1 \cos \frac{n\pi}{2} + C_2 \sin \frac{n\pi}{2}\right)$

f) $2^{3n/2}\left(C_1 \cos \frac{3n\pi}{4} + C_2 \sin \frac{3n\pi}{4}\right)$ g) $C_1 + C_2 \cdot 2^n + C_3 \cdot 3^n$

h) $C_1 + C_2 n + C_3 n^2$

1710. $y_n = 2^{2-n} \sin \frac{n\pi}{6}$; $y_{101} = 1/2^{100}$

1711. $\frac{1}{3}(x_0 + 2x_1)$

1712. a) $p_2 = 1,\ p_3 = 0.8,\ p_4 = 0.6,\ p_n = \sqrt{5}\left(\frac{5+\sqrt{5}}{10}\right)^n - \sqrt{5}\left(\frac{5-\sqrt{5}}{10}\right)^n$

b) $p_n < 0.1 \Leftrightarrow n \geq 10$

1713. $p_n = \dfrac{(q/p)^n - (q/p)^a}{1-(q/p)^a}$ om $q \neq p$, $p_n = 1 - n/a$ om $q = p = 1/2$

1715. a) $C_1 + C_2 \cdot 3^n + 2n$ b) $C_1 + C_2 n - 2n^2$ c) $C_1 \cdot 5^n + C_2 \cdot (-2)^n - 3n + 2$

d) $2^{n/2} \cdot \left(C_1 \cos \frac{3n\pi}{4} + C_2 \sin \frac{3n\pi}{4}\right) + \frac{1}{5}n^3 - \frac{12}{25}n^2 + \frac{6}{125}n + \frac{86}{225}$

e) $\frac{5}{3} \cdot 2^n + \frac{10}{3}\left(\frac{1}{2}\right)^n - 2n - 4$ f) $10(-2)^n + n^3 + 2n^2 + 27n - 5$

g) $5n + 2 - (2\sqrt{2})^n \left(2\cos\frac{n\pi}{4} + \sin\frac{n\pi}{4}\right)$

h) se 1707c i) se 1707d j) se 1707e

1716. a) $C_1 + C_2(-2)^n + \frac{1}{10} \cdot 3^n$ b) $\left(\frac{1}{12}n^2 - \frac{7}{36}n + C_1\right) 2^n + C_2(-1)^n$

c) $C_1 + \left(\frac{1}{12}n^2 - \frac{1}{3}n + C_2\right) \cdot 3^n$ d) $\left(-\frac{33}{64} + \frac{n}{16} - \frac{n^2}{8}\right)(-1)^n + \frac{33}{64} \cdot (-5)^n$

e) $\left(\frac{11-2\sqrt{3}}{12} + \left(\frac{1}{4} - \frac{\sqrt{3}}{12}\right)n\right)(1+\sqrt{3})^n + \frac{1+2\sqrt{3}}{12}(1-\sqrt{3})^n$

f) $\left(\frac{4n}{13} + \frac{8}{169}\right) \cdot \left(\frac{1}{2}\right)^n - \frac{2^{n+1}}{169}\left(4\cos\frac{n\pi}{3} + \frac{11}{\sqrt{3}}\sin\frac{n\pi}{3}\right)$ g) se 1707a

1717. a) $(C_1 + C_2 n) \cdot 2^n + 6 + 3n + \frac{1}{8}n^2 2^n$

b) $2^n \left(\frac{1}{2}\cos\frac{n\pi}{3} + \frac{\sqrt{3}}{2}\sin\frac{n\pi}{3}\right) + (n-1)2^{n-2} + \frac{1}{12} \cdot 4^n$

c) $\left(C_1 + \frac{n}{4}\right) \cdot 2^n + C_2 \cdot (-2)^n + 2n^2 - 3$

d) $\left(\frac{n^2}{4} + n - \frac{1}{8}\right)\left(\frac{1}{3}\right)^n + \frac{3}{8}\left(-\frac{1}{3}\right)^n + n + \frac{3}{4}$

e) $2^n \left(C_1 \cos\frac{n\pi}{3} + C_2 \sin\frac{n\pi}{3}\right) - n \cdot 2^n \left(\frac{\sqrt{3}}{24}\cos\frac{n\pi}{3} + \frac{1}{8}\sin\frac{n\pi}{3}\right)$

f) $C_1 \cos\frac{n\pi}{2} + C_2 \sin\frac{n\pi}{2} + \left(\frac{n}{2} - \frac{n^2}{4}\right)\sin\frac{n\pi}{2}$ g) se 1707b

1718. $y_n = 3 \cdot 4^{n-1} - (n^2 + n + 6) \cdot 2^{n-3}$, $y_{12} = 12\,499\,968$

1719. a) $Y_n = 0.9^{(n/2)-1}\left((1.8Y_1 - Y_2 - 8I)\cos\left(n\arctan\frac{1}{3}\right) + \right.$
$\left. +3(Y_2 - 0.8Y_1 - 2I)\sin\left(n\arctan\frac{1}{3}\right)\right) + 10I$ b) $Y_n = 2Y_1 - Y_2 + (Y_2 - Y_1)n$

1720. a) $3 + (2-n)\cdot 2^n + 3^n$ b) $\frac{1}{8} - \frac{1}{2}n + \frac{1}{4}n^2 - \frac{1}{8}\cdot(-1)^n$
c) $3 - 2n + n^2 + (-1)^n$

1721. a) $\left(\frac{\sqrt{5}+1}{2}\right)^{n+1} - \left(\frac{\sqrt{5}-1}{2}\right)^{n+1}$ b) $n+1$ c) $2\sin\frac{(n+1)\pi}{6}$
d) $\frac{2}{\sqrt{3}}\sin\frac{(n+1)\pi}{3}$ e) $\cos\frac{n\pi}{2}$

1722. $y_n = \frac{2}{\sqrt{3}}\sin\frac{(n+1)\pi}{3}$, $z_n = \frac{2}{\sqrt{3}}\sin\frac{n\pi}{3}$

KAPITEL 18

1801. a) 1 b) 1 c) 10 d) 1/3 e) 5.4

1803. a) 1/2 b) 2 c) 1

1804. a) $s_n = \frac{1}{2}\left(1 - \frac{1}{2n+1}\right)$; $s = 1/2$ b) $s_n = \frac{1}{3}\left(1 - \frac{1}{3n+1}\right)$; $s = 1/3$
c) $s_n = \frac{1}{2}\left(1 + \frac{1}{2} - \frac{1}{n+1} - \frac{1}{n+2}\right)$; $s = 3/4$
d) $s_n = \frac{1}{3}\left(1 + \frac{1}{2} + \frac{1}{3} - \frac{1}{n+1} - \frac{1}{n+2} - \frac{1}{n+3}\right)$; $s = 11/18$
e) $s_n = \frac{1}{p}\left(1 + \frac{1}{2} + \ldots + \frac{1}{p} - \frac{1}{n+1} - \frac{1}{n+2} - \ldots - \frac{1}{n+p}\right)$; $s = \frac{1}{p}\sum_{k=1}^{p}\frac{1}{k}$
f) $s_n = \frac{1}{2}\left(\frac{1}{2} - \frac{1}{(n+1)(n+2)}\right)$; $s = 1/4$
g) $s_n = 4 - \left(\frac{1}{2}\right)^n - 3\cdot\left(\frac{3}{4}\right)^n$; $s = 4$ h) $s_n = \frac{1}{8}\left(1 - \frac{1}{(2n+1)^2}\right)$; $s = 1/8$

1805. a) 1; 1.5; 2.083 33; 2.717 86
c) 2.928 97; 4.499 21; 5.187 38; 6.792 82; 9.094 51

1806. $1\frac{1}{9}$ s; $11\frac{1}{9}$ m resp. $1\frac{1}{9}$ m

1807. Nej

1808. 187.5 m

1809. $2 + \sqrt{3}$ l.e.

1812. a) 1 b) 1 c) 1 d) 1 e) 3 f) 7 g) div. mot ∞

1814. $N = 199$

1815. c) $\frac{1}{2}(\sqrt{5}+1)$

1816. a) 2 b) $\frac{1}{2}(\sqrt{13}+1)$

1817. $\ln 2$

1818. a) $\frac{1}{2}(\sqrt{5}-1)$ b) 1

1819. a) 0.0084 resp. 30 104 b) 0.0042 resp. $1.012 \cdot 10^{16}$
c) 0.0028 resp. $7.358 \cdot 10^{29}$

1820. a) 0 b) $1/e$ c) $1/4$ d) $1/k^k$

1824. Hur långt som helst.

1825. a) $8\,104 \leq n \leq 22\,026$ b) $9 \cdot 10^{42} < n < 3 \cdot 10^{43}$
c) $n = 12\,367$ resp. $n \approx 1.509 \cdot 10^{43}$

1827. a) Konv. b) konv. c) konv. d) konv.

1828. a) Konv. b) konv. c) div. d) konv.

1829. a) Konv. b) konv. c) div. d) konv.

1830. a) Div. b) konv. c) div. d) konv.

1831. a) $-\ln 2$ b) $11/96$ c) -1

1832. a) $0 < x < 1$ b) $0 < x < 1/e$

1834. Konv.

1835. a) Konv. b) konv.

1836. a) Konv. b) div. c) konv. d) div. e) konv.

1837. a) Konv. b) konv. c) konv. d) div.

1838. T.ex. $a_n = (-1)^n/\sqrt{n}$ och $b_n = (-1)^n/\sqrt{n} + 1/n$

1840. Konv.

1841. a) Konv. med summan $\frac{3}{4}\ln 2$ b) div.

KAPITEL 19

1901. a) $\sum_{k=0}^{\infty} \frac{x^{2k}}{(2k)!}$, alla x b) $\sum_{k=0}^{\infty} \frac{x^{2k+1}}{(2k+1)!}$, alla x c) $\sum_{k=0}^{\infty} \frac{1}{k!}x^{k+1}$, alla x
d) $\sum_{k=1}^{\infty} \frac{1}{k!}x^{k-1}$, alla x e) $\sum_{k=0}^{\infty}(-1)^k \frac{x^{2k}}{2k+1}$, $|x| \leq 1$
f) $\sum_{k=1}^{\infty}(-1)^{k-1}\frac{x^{2k}}{2k}$, $|x| \leq 1$ g) $-2x + 4\sum_{n=1}^{\infty} \frac{x^{2n+1}}{4n^2-1}$, $|x| < 1$

h) $\frac{1}{2}\sum_{k=1}^{\infty}(-1)^{k-1}\frac{(2x)^{2k}}{(2k)!}$, alla x

1902. a) $-2 < x \le 2$ b) $|x| < e$ c) $|x| < 1/e$ d) $|x| < 1$
e) $x = 0$ f) $-1/e \le x < 1/e$ g) alla x h) $|x| < e^2$
i) $-1 \le x < 1$ j) $-1 \le x < 1$ k) $-1 \le x \le 1$ l) $-1 \le x < 1$
m) $-1/2 \le x < 1/2$ n) $-1/e \le x \le 1/e$ o) $-1 \le x < 1$ p) $|x| < 1$
q) $-5 \le x < 5$ r) $|x| < 1/2$

1903. a) $|x| < \sqrt{3}$ b) $|x| < \sqrt{e}$ c) $-2^{-1/3} \le x < 2^{-1/3}$

1904. a) 4 b) 27 c) k^k d) 1

1906. a) $-\sum_{n=0}^{\infty}\frac{x^n}{2^{n+1}}$, $|x| < 2$ b) $-\sum_{n=0}^{\infty}\frac{x^{2n}}{4^{n+1}}$, $|x| < 2$

c) $1 + 4\sum_{n=1}^{\infty}(-1)^n n x^n$, $|x| < 1$ d) $\frac{1}{2}\sum_{n=0}^{\infty}(n+1)(n+2)x^n$, $|x| < 1$

e) $\sum_{n=0}^{\infty}\left(1 - \frac{1}{2^{n+1}}\right)x^n$, $|x| < 1$

1907. $x + \sum_{n=1}^{\infty}\frac{(2n-1)!!}{(2n)!!}\frac{x^{2n+1}}{2n+1}$, $|x| \le 1$

1908. a) $|x| \le 1$, $1 - \frac{1}{2}\ln(1+x^2)$ b) $|x| \le 1$, $x \arctan x - \frac{1}{2}\ln(1+x^2)$

c) $|x| \le 1$, $-\frac{x}{2} + \frac{x^2-1}{4}\ln\frac{1+x}{1-x}$

1909. a) $\ln 2$ b) 6 c) 0.64 d) e, $2e$ resp. $5e$ e) $e + 1$

f) $\frac{5}{36} - \frac{4}{9}\ln\frac{4}{3}$ g) $33/8$

1910. $\frac{2}{3}e^{-x/2}\cos\frac{x\sqrt{3}}{2} + \frac{1}{3}e^x$

1911. $xf'(x)$, $x^2f''(x) + xf'(x)$, $x^3f'''(x) + 3x^2f''(x) + xf'(x)$

1913. $\frac{\ln(1-x)}{x-1}$

1914. a) $\sum_{n=0}^{\infty}\frac{x^n}{(n!)^2}$, $R = \infty$ b) $\sum_{n=1}^{\infty}\frac{nx^n}{(n!)^2}$, $R = \infty$

c) $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{x^n}{n!(n-1)!}$, $R = \infty$

d) $a_0 + a_1x - a_0x^2 - a_1\frac{x^3}{3!} - \sum_{k=2}^{\infty}c_k x^{2k+1}$, där $c_k = a_1\frac{(2k-3)!!}{(2k+1)!}$, $R = \infty$

1915. $a_0\left(1+\sum_{n=1}^{\infty}\frac{1\cdot 4\cdot 7\cdot\ldots\cdot(3n-2)}{(3n)!}x^{3n}\right)+$
$+a_1\left(x+\sum_{n=1}^{\infty}\frac{2\cdot 5\cdot 8\cdot\ldots\cdot(3n-1)}{(3n+1)!}x^{3n+1}\right)$

1916. Alla x, $y = x\cos x + \sin x - x$

1917. $R = 1$

1918. $f(x) = 0$ för $0 < x < 1$, $f(1) = 1$, diskont. i 1

1919. a) $f(x) = 0$ för $x \neq 0$, $f(0) = 1$
b) $f(x) = 0$ för $|x| < 1$, $f(x) = 1$ för $|x| > 1$, $f(\pm 1) = 1/2$

1920. 0 resp. 1

1921. 0 resp. $\pi/3$

1922. a) Båda är x b) 0 resp. $\lim_{n\to\infty} s_n'(x) = \begin{cases} 1 & \text{för } x = 0 \\ 0 & \text{annars} \end{cases}$

1924. a) $f(x) = -x$ för $0 \leq x < 1$, $f(x) = x$ för $x > 1$, $f(1) = 0$
b) nej resp. ja

1925. $f_n(x) \to 0$ men ej likformigt, ty $f_n\left(\frac{1}{n^2}\right) = \frac{n}{2} \to \infty$

1926. a) $s(x) = x^2+1$ för $x \neq 0$, $s(0) = 0$ b) $s(x) = \frac{1}{x}$, $x \neq 0, -1, -2, \ldots$

1928. $s(x) = \frac{x}{e^x - 1}$ för $x > 0$, $s(0) = 0$, nej

1930. $2/3$

1931. $\frac{1}{2}(\pi - 1)$

1932. $\frac{1}{2}(\ln 2 + 1)$

1933. $\pi/2$

1934. a) $1/2$ b) $2/\pi$

1937. 1 resp. $-2\sum_{n=1}^{\infty}(n+x)^{-3}$

1941. $\sum_{k=0}^{\infty}(-4)^k\left[\frac{x^{4k}}{(4k)!}+\frac{(1+i)x^{4k+1}}{(4k+1)!}+\frac{2ix^{4k+2}}{(4k+2)!}+\frac{(-2+2i)x^{4k+3}}{(4k+3)!}\right]$,
$\sum_{k=0}^{\infty}(-4)^k\left[\frac{x^{4k}}{(4k)!}+\frac{x^{4k+1}}{(4k+1)!}-\frac{2x^{4k+3}}{(4k+3)!}\right]$ resp.
$\sum_{k=0}^{\infty}(-4)^k\left[\frac{x^{4k+1}}{(4k+1)!}+\frac{2x^{4k+2}}{(4k+2)!}+\frac{2x^{4k+3}}{(4k+3)!}\right]$

1942. a) $z = \pi i(1+2n)$ b) $z = \frac{\pi}{2} \pm i\ln(2+\sqrt{3}) + 2n\pi$

c) $\pm z = \frac{\pi}{2} - i\ln(1+\sqrt{2}) + 2n\pi$

d) $z = \arctan\frac{1}{2} - \frac{i}{2}\ln 5 + 2n\pi$ och $z = \pi - \arctan\frac{1}{2} + \frac{i}{2}\ln 5 + 2n\pi$

KAPITEL 20

2001. $P(u,v)$ är inte entydigt bestämt

2002. a) alla t b) inga t c) $t = n\pi$ för $n \in \mathbf{Z}$

2003. a) $\frac{1}{2} + \frac{2}{\pi}\sum_{k=1}^{\infty}\frac{(-1)^{k-1}}{2k-1}\cos(2k-1)x$ b) $\frac{4}{\pi}\sum_{k=1}^{\infty}\frac{(-1)^{k-1}}{2k-1}\cos(2k-1)x$

c) $\sum_{n=1}^{\infty} b_n \sin nx$ med $b_n = \begin{cases} 2/n\pi & \text{för} \quad \text{udda } n \\ 4/n\pi & \text{för} \quad n = 4k+2 \\ 0 & \text{för} \quad n = 4k \end{cases}$

d) $a_n = (-1)^k \frac{2}{n\pi}$ för udda $n = 2k-1$, $b_{4k+2} = -\frac{2}{\pi(2k+1)}$, övriga koeff. $= 0$

e) $\frac{\pi}{2} - \frac{4}{\pi}\sum_{k=1}^{\infty}(2k-1)^{-2}\cos(2k-1)x$ f) $\frac{\pi^2}{3} - 4\sum_{k=1}^{\infty}\frac{(-1)^{k-1}}{k^2}\cos kx$

g) $\frac{\pi}{2} + \frac{4}{\pi}\sum_{k=1}^{\infty}(2k-1)^{-2}\cos(2k-1)x$ h) $\frac{4}{\pi}\sum_{k=1}^{\infty}(-1)^{k-1}(2k-1)^{-2}\sin(2k-1)x$

i) $\frac{\pi^2}{3} + \sum_{k=1}^{\infty}\frac{(-1)^k}{k^2}(4\cos kx - 2k\sin kx)$ j) $1 - \frac{1}{2}\cos x - 2\sum_{k=2}^{\infty}\frac{(-1)^k}{k^2-1}\cos kx$

k) $\frac{1}{\pi} - \frac{1}{2}\sin x - \frac{2}{\pi}\sum_{k=1}^{\infty}\frac{1}{4k^2-1}\cos 2kx$

l) $\frac{\pi^2}{6} + \sum_{k=1}^{\infty}\left\{(-1)^k\frac{2}{k^2}\cos kx + \left[(-1)^k\left(\frac{2}{\pi k^3} - \frac{\pi}{k}\right) - \frac{2}{\pi k^3}\right]\sin kx\right\}$

2005. $\sin x + \cos 2x$

2006. I alla deluppgifterna har fourierseriens summa $s(x)$ perioden 2π.
För $-\pi < x \le \pi$ är $s(x) = f(x)$ med **följande undantag**:

a) $s(\pm\pi/2) = 1/2$ b) $s(\pm\pi/2) = 0$

c) $s(-\pi/2) = -1/2$, $s(0) = 0$, $s(\pi/2) = 1/2$

d) $s(0) = -1/2$, $s(\pi/2) = 0$, $s(\pi) = 1/2$

g) $s(0) = \pi$ i) $s(\pi) = \pi^2$ l) $s(\pi) = \pi^2/2$

2007. a) $\frac{2}{\pi} + \sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{\pi(n^2-1/4)}\cos nx$ b) $\left|\cos\frac{x}{2}\right|$ c) 2

2008. a) $\frac{4\pi^2}{3} + 4\sum_{n=1}^{\infty}n^{-2}(\cos nx - n\pi\sin nx)$ b) $\pi^2/6$