

# SOUHRN – TAYLORŮV POLYNOM

Níže uvedené příklady se objevily ve zkouškových testech v minulých letech.

Zadání	Výsledky
1) $f(x) = x^2 + 2 - \sqrt{1-x}$	a = 0      1✓ $T_3(x) = 1 + \frac{1}{2}x + \frac{9}{8}x^2 + \frac{1}{16}x^3$
2) $f(x) = (x-1) \cdot \ln x + 1$	a = 1      2✓ $T_3 = 1 + (x-1)^2 - \frac{1}{2} \cdot (x-1)^3$
3) $f(x) = (x-2) \cdot \ln(x-3) + 1$	a = 4      3✓ $T_3(x) = 1 + 2 \cdot (x-4) + \frac{1}{6} \cdot (x-4)^3$
4) $f(x) = x^2 - \ln(2x-1)$	a = 1      4✓ $T_3(x) = 1 + 3 \cdot (x-1)^2 - \frac{8}{3} \cdot (x-1)^3$
5) $f(x) = (x+2) \cdot \ln(x-3) - 1$	a = 4      5✓ $T_3(x) = -1 + 6(x-4) - 2 \cdot (x-4)^2 + \frac{3}{2} \cdot (x-4)^3$
6) $f(x) = x^{\frac{3}{2}} - \sqrt{3-2x}$	a = 1      6✓ $T_3(x) = \frac{5}{2} \cdot (x-1) + \frac{7}{8} \cdot (x-1)^2 + \frac{7}{16} \cdot (x-1)^3$
7) $f(x) = x^2 - \sqrt{2-x}$	a = 1      7✓ $T_3(x) = \frac{5}{2} \cdot (x-1) + \frac{9}{8} \cdot (x-1)^2 + \frac{1}{16} \cdot (x-1)^3$
8) $f(x) = x^2 - x + 2e^{2x+1}$	a = $-\frac{1}{2}$ 8✓ $T_3(x) = \frac{11}{4} + 2 \cdot \left(x + \frac{1}{2}\right) + 5 \cdot \left(x + \frac{1}{2}\right)^2 +$ $+ \frac{8}{3} \cdot \left(x + \frac{1}{2}\right)^3$
9) $f(x) = x^2 - 2x + 1 + \cos(3x)$	a = 0      9✓ $T_3(x) = 2 - 2x - \frac{7}{2}x^2$
10) $f(x) = x \cdot e^{-2x}$	a = 0      10✓ $T_3(x) = x \cdot (1 - 2x + 2x^2)$
11) $f(x) = x^{\frac{5}{2}} - \sqrt{2-x}$	a = 1      11✓ $T_3(x) = 3 \cdot (x-1) + 2 \cdot (x-1)^2 + \frac{27}{2} \cdot (x-1)^3$
12) $f(x) = x^2 + x + 3 - e^{2x+1}$	a = $\frac{1}{2}$ 12✓ $T_3(x) = \frac{1}{4} \cdot (15 - 4e^2) + (2 - 2e^2) \cdot \left(x - \frac{1}{2}\right) +$ $+ (1 - 2e^2) \cdot \left(x - \frac{1}{2}\right)^2 - \frac{4}{3}e^2 \cdot \left(x - \frac{1}{2}\right)^3$
13) $f(x) = \frac{1}{x} + \sqrt{3+2x}$	a = -1      13✓ $T_3(x) = -\frac{3}{2} \cdot (x+1)^2 - \frac{1}{2} \cdot (x+1)^3$
14) $f(x) = x^2 + 3 + e^{2x-1}$	a = $\frac{1}{2}$ 14✓ $T_3(x) = \frac{17}{4} + 3 \cdot \left(x - \frac{1}{2}\right) + 3 \cdot \left(x - \frac{1}{2}\right)^2 +$ $+ \frac{4}{3} \cdot \left(x - \frac{1}{2}\right)^3$
15) $f(x) = \cos 2x + \sqrt{x} \cdot \sin \frac{x}{2}$	a = $\frac{\pi}{2}$ 15✓ Nepočítán
16) $f(x) = \frac{1}{2} \cdot \sin 2x + \cos x$	a = $\frac{\pi}{4}$ 16✓ Nepočítán

- |     |   |                     |     |           |
|-----|---|---------------------|-----|-----------|
| 17) | $f(x) = \sin x + 2 \cdot \cos 2x$   | $a = \frac{\pi}{4}$ | 17✓ | Nepočítán |
| 18) | $f(x) = \sqrt{2} \cdot x^{\frac{3}{2}} - \ln\left(\frac{x}{2}\right)$             | $a = 2$             | 18✓ | Nepočítán |
| 19) | $f(x) = 3 + 2 \ln(9x^2 - 1)$  | $a = 0$             | 19✓ | Nepočítán |
| 20) | $f(x) = \sin\left(x + \frac{\pi}{3}\right) + \cos\left(2x - \frac{\pi}{6}\right)$ | $a = 0$             | 20✓ | Nepočítán |
| 21) | $f(x) = \frac{8}{x} + \ln\left(\frac{x}{2}\right)$                                | $a = 2$             | 21✓ | Nepočítán |