

BM1 2019/20 - Zadání zápočtových projektů

Lukáš Pospíšil

1. dubna 2020

Vyšetřete průběh funkce:

- 1.) (a) $f(x) = (x - 1)\sqrt[3]{x}$
(b) $f(x) = \frac{x^2}{4-x^2}$
- 2.) (a) $f(x) = x^2 + 2 - \frac{1}{x}$
(b) $f(x) = \arcsin\sqrt{x}$
- 3.) (a) $f(x) = x^2 - \frac{1}{x^2}$
(b) $f(x) = \ln(x^2 - 2x)$
- 4.) (a) $f(x) = \frac{x}{x^2-1}$
(b) $f(x) = x \cdot e^{\frac{1}{x}}$
- 5.) (a) $f(x) = \frac{x^4}{(1-x)^3}$
(b) $f(x) = 3(x+2) \cdot e^{-x}$
- 6.) (a) $f(x) = x + \frac{2x}{x^2-1}$
(b) $f(x) = x - \ln x$
- 7.) (a) $f(x) = \frac{\ln x}{2x}$
(b) $f(x) = 3x^2(x+1)^3$
- 8.) (a) $f(x) = -\frac{2}{x} + x$
(b) $f(x) = x \cdot e^{-2x}$
- 9.) (a) $f(x) = \ln(x^2 - 16)$
(b) $f(x) = \frac{(x-1)^2}{x^2+1}$
- 10.) (a) $f(x) = (x-2)^2(x+1)^3$
(b) $f(x) = x + \ln(x^2 + 1)$
- 11.) (a) $f(x) = e^{2x}x^2$
(b) $f(x) = \frac{x^3}{4-x^2}$
- 12.) (a) $f(x) = \frac{3x}{1+x} - 1$
(b) $f(x) = x^3 \cdot e^{-x}$
- 13.) (a) $f(x) = -\frac{x^2}{3x+1}$
(b) $f(x) = \frac{x}{2} + \operatorname{arccotg} x$

14.) (a) $f(x) = \frac{x(x+2)}{x+1}$

(b) $f(x) = x - 2\arctg x$

15.) (a) $f(x) = \frac{1}{x(x^2-3)}$

(b) $f(x) = \ln(1+x^2)$

16.) (a) $f(x) = \frac{x^2-2x+1}{x^2+1}$

(b) $f(x) = \frac{\ln^2 x}{x}$

17.) (a) $f(x) = \frac{4(x+1)}{x^2} - 2$

(b) $f(x) = x \cdot e^x$

18.) (a) $f(x) = \sqrt{\frac{x+3}{x-3}}$

(b) $f(x) = x^4 - 4x^3 + 4x^2$

19.) (a) $f(x) = x + \frac{2}{x}$

(b) $f(x) = \ln(x + \sqrt{x^2+1})$

20.) (a) $f(x) = \frac{x}{2+x^2}$

(b) $f(x) = \frac{x^2}{2} - \ln x$

21.) (a) $f(x) = \frac{x^4}{(1+x)^2}$

(b) $f(x) = x \ln x$

22.) (a) $f(x) = \frac{2x^3}{x^2+1}$

(b) $f(x) = x^3 \cdot e^{-2x}$

23.) (a) $f(x) = \frac{2x}{1+x^2} + 1$

(b) $f(x) = e^{-x^2}$

24.) (a) $f(x) = \frac{x^2}{4-x^2}$

(b) $f(x) = (x-1) \cdot \sqrt{x}$

25.) (a) $f(x) = x + 1 + \frac{1}{x}$

(b) $f(x) = \arcsin \sqrt{x}$

26.) (a) $f(x) = x^2 - \frac{1}{x^2}$

(b) $f(x) = \ln(x^2 - 2x)$

27.) (a) $f(x) = \frac{x^4}{(1+x)^3}$

(b) $f(x) = (x+2) \cdot e^{-x}$

28.) (a) $f(x) = x - \ln x$

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

29.) (a) $f(x) = -\ln(x^2 - 9)$

(b) $f(x) = \frac{(x-4)^2}{x^2+1}$

30.) (a) $f(x) = 16x(x-1)^3$

(b) $f(x) = x^2 e^{\frac{1}{x}}$