

1) $\{-10; 6\}$

2) $x \in (-5; 2)$

3) $x = 2$

4) $x \in (-1; 1) \cup (4; +\infty)$

5) $\nu = -19 \quad x_2 = \frac{4}{3}$

6) $x^2 - 20x + 64 = 0$

7) podmínka: $x \in (-\infty; 3) \quad x = -1$

8) $x = 2$, podm. $x \in (-4; +\infty)$

9) $\mu = 0: K = \emptyset; \mu = 2: x \in \mathbb{R} - \{1\}; \mu \neq 0; 2 \quad x = \frac{\mu+2}{\mu}$

10) $m \in (0; \frac{3}{4})$

11) $x \in \{1; 2; 3; 4\}$

12) $x \in (-4; \frac{3}{2})$

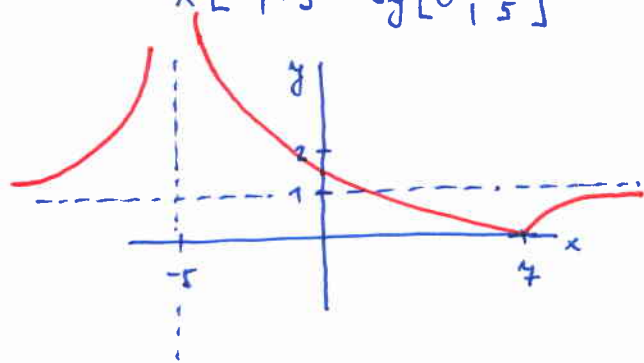
13) $x \in (-\infty; 1) \cup (2; +\infty)$

14) $x \in (-\infty; 0) \cup (2; 3)$

15) free μ ľubhá'

16) $y = \left| 1 + \frac{-12}{x+5} \right| \quad S[-5; 1]$
 $k = -12 \Rightarrow \text{II a IV. kv.}$

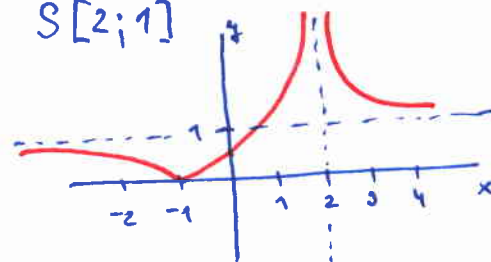
$R_x[7; 0] \quad R_y[0; \frac{7}{5}]$



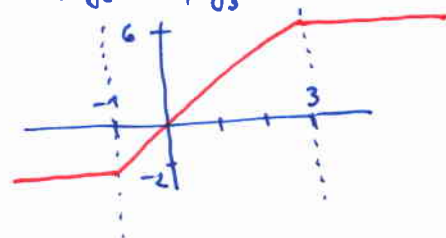
18) množina: $(-\infty; -1) \cup (2; +\infty)$

rozdručená: $(-1; 2)$

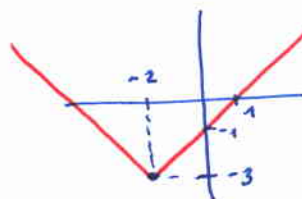
$S[2; 1]$



19) $y_1 = -2, y_2 = 2x, y_3 = 6$

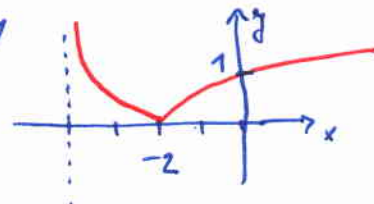


20) $y_1 = -x - 5, y_2 = x - 1$



21) $\mu \in (-\infty; -\frac{1}{2}) \cup (1; +\infty)$

22) 1



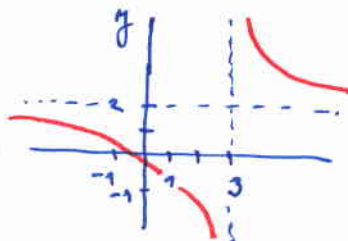
23)

24) $x = 5$

25) $K = \{1; 3\}$

17) $D_f = \mathbb{R} - \{3\} \quad H_f = \mathbb{R} - \{2\}$

$R_x[-\frac{1}{2}; 0] \quad R_y[0; -\frac{1}{3}] \quad S[3; 2]$



26) $a = 2 \cdot \sqrt{14 \cdot \sqrt{2}} \text{ cm} \approx 8,9 \text{ cm}$

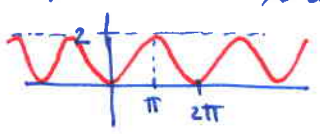
27) $F = 100,5 \text{ N}, \beta = 32^\circ$

28) $a = 24 \text{ cm}, b = 10 \text{ cm}$

29) $BP = 1,8 \text{ cm}, r_c = \frac{12}{5} = 2,4 \text{ cm}, k_c = \frac{25}{10} = 2,5 \text{ cm}$

30) $k = \{x; |FA \times B| = 75^\circ\} l(S_{AB}; r = k_c) \in b \cap l$

31) $17 = 2 \cdot 8,5 \text{ napr. } c = 10,5 \text{ cm, } \epsilon. v. \text{ ovyse}$

32) $y = -\cos x + 1$ 

33) $\cos 290^\circ < \cos 20^\circ$

34) $6|x| \Leftrightarrow 2|x| \wedge 3|x|$

35) $(n+1)(n+2) = (n+1)(n+2)$

36) $x_1 = \frac{\pi}{3} + 2k\pi, x_2 = \frac{5}{3}\pi + 2k\pi$

37) $x_1 = k\pi, x_2 = 2k\pi, x_3 = \frac{2}{3}\pi + 2k\pi, x_4 = \frac{4}{3}\pi + 2k\pi$

38) $[1; 2; 3]$

39) $[3; -1], [1; -3]$

40) $r(E, S_{EH}, S_{EF}, S_{AD}) = \sqrt{2} \text{ cm}$

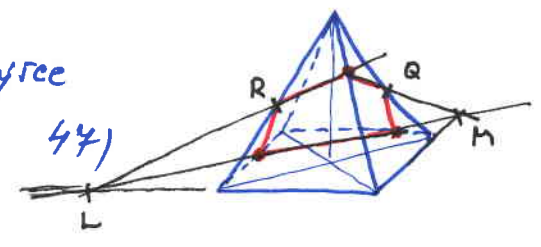
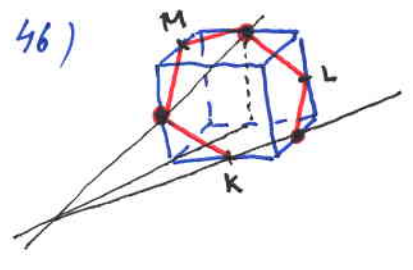
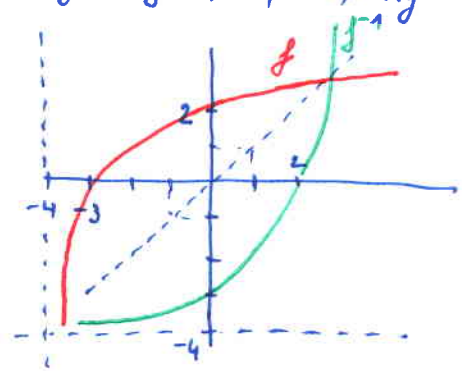
41) $\alpha = 42^\circ 27'$

42) $V = \frac{\pi}{12} \text{ m}^3, S = \frac{\pi}{4} (1 + \sqrt{5}) \text{ m}^2$

43) $S_{pl} = 18\pi \text{ dm}^2$

44) $f(g(x)) = (3x^2 + 9x + 7)_{(1)} = 19, g(f(x)) = (9x^2 + 15x + 6)_{(1)} = 30$

45) $f: D_f = (-4; +\infty) \text{ } H_f = \mathbb{R}, R_x[-3; 0], R_y[0; 2], f^{-1}: y = 2^x - 4, D_{f^{-1}} = \mathbb{R}, H_{f^{-1}} = (-4; +\infty)$



47) $\sqrt{3}x + y - 2\sqrt{3} = 0$
 48) $P_1[-4; 4], P_2[1; -6]$
 49) $4x - 7y - 12 + 6 = 0$

51) a) $\varphi = 0^\circ$ b) $\varphi = 90^\circ$

52) $k = \{x; \angle A \times B = 120^\circ\}$, $r \parallel AB$, $C \in k \cap r$

53) BC , $\angle B \times C = 135^\circ$, $l(B, r = \frac{BD}{2})$, S, D

54) $k_1: x + 3y - 9 = 0$ $k_2: x + 3y + 9 = 0$

55) $d_1 = 2$ $d_2 = -4$

56) $\frac{(x-4)^2}{4} - \frac{(y-2)^2}{16} = 1$

57) $k_1: 5x - 2y + 9 = 0$ $k_2: 5x - 2y - 9 = 0$

58) a) kružnice $S[3;4]$ $r = \frac{7}{2}$ $(x-3)^2 + (y-4)^2 = \frac{49}{4}$

b) parabola $V[-2;3]$ $p=2$ $F[-1;3]$ $d: x=-3$ $(y-3)^2 = 4(x+2)$

59) $k_1: y = x + 5$ $k_2: y = x - 5$

60) $k_1: (x-3)^2 + (y-5)^2 = 25$ $k_2: (x-6)^2 + (y-4)^2 = 25$

61) $\frac{xy^2}{x-y}$; $x \neq 0, y \neq 0, x \neq y$

62) $b^{-\frac{11}{3}} d^{-1}$; $a > 0 \wedge c > 0 \wedge d > 0, b \neq 0$

63) $\operatorname{Re} z = \frac{1}{2}$ $\operatorname{Im} z = -\frac{1}{2}$ $R = \frac{\sqrt{2}}{2} (\cos \frac{7}{4}\pi + i \sin \frac{7}{4}\pi)$

64) $z = -\frac{3\sqrt{3}}{2} + \frac{3}{2}i$ $\bar{z} = -\frac{3\sqrt{3}}{2} - \frac{3}{2}i$

65) $z = 2 (\cos \frac{5}{3}\pi + i \sin \frac{5}{3}\pi)$ $z^5 = 32 (\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}) = 16 + 16\sqrt{3}i$

66) $\cos 3x = \cos^3 x - 3 \cos x \sin^2 x$ $\sin 3x = 3 \cos^2 x \sin x - \sin^3 x$

67) $6+y$ člen: $(\frac{10}{5})(\frac{x}{4})^{10}(-\frac{\sqrt{2}}{x^2})^5$

68) $m \in \{4; 5\}$

69) $x = 5$; podmínka $x \geq 4$

70) $z = 1 - 7i$

71) $R_1 = 3i$ $R_2 = i$

72) $R_0 = 4 (\cos \frac{\pi}{6} + i \sin \frac{\pi}{6}) = 2\sqrt{3} + 2i$

$R_1 = 4 (\cos \frac{5}{6}\pi + i \sin \frac{5}{6}\pi) = -2\sqrt{3} + 2i$

$R_2 = 4 (\cos \frac{3}{2}\pi + i \sin \frac{3}{2}\pi) = -4i$

73) $R = \sqrt[6]{2}$

74) $\bar{x} = 171 \text{ cm}$ $\operatorname{mod}(x) = 167 \text{ cm}$
 $\operatorname{med}(x) = 172 \text{ cm}$

75) $\bar{I} = 249,7 \text{ mA}$

$R_x = 2 \text{ mA}$

$R_x = 0,62 \%$

46) $a = 18 \text{ cm}$ $b = 24 \text{ cm}$

47) $a_1 = 3$ $q = 2$ $m = 10$

48) \emptyset

49) $d = 9\pi \text{ cm}$

80) 1

81) $\frac{1}{2}$

82) $y' = \frac{3 \cos x}{3 \sin x - 8}$

83) $y' = 2x_0 - 4$ $y'(1) = -2$

84) $y + 6 = 0$

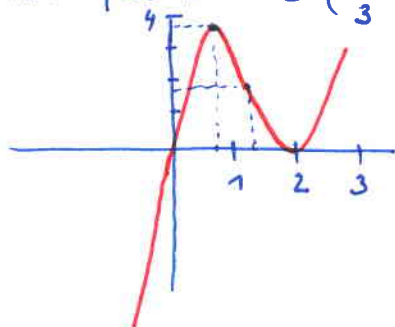
85) $v = \omega y_m \cos(\omega t)$ $a = -\omega^2 y_m \sin(\omega t)$

86) $D_f = \mathbb{R}$, $D_g = \mathbb{R}$, a.s. bez sudnic - nesk., a.s. s sudnicu' nesk.,
 ekstremy $\min v [2; 0]$ $\max v [\frac{2}{3}; \frac{32}{9}]$

rostouci: $x \in (-\infty; \frac{2}{3}) \cup (2; +\infty)$ inflex. bod $x = \frac{4}{3}$ $y = 1, \dot{v}$

klesajuci: $x \in (\frac{2}{3}; 2)$

konvex: $x > \frac{4}{3}$ konkav: $x < \frac{4}{3}$



87) $V = \pi r_1^2 r_2^2 = \pi r_1^2 \frac{(r - r_1)}{r} \cdot v$ $V' = \frac{dV}{dr_1} = 0 \Rightarrow r_1 = \frac{2}{3} r = 4 \text{ cm}$ $r_2 = 1 \text{ cm}$

88) $r = 2a + 2b = \frac{2S}{b} + 2b$ $r' = \frac{dr}{db} = -\frac{2S}{b^2} + 2 = 0 \Rightarrow S = b^2 \Rightarrow a = b = 4 \text{ cm}$

89) $D_f = \mathbb{R}$ rostouci na $(-\infty; -\frac{\sqrt{6}}{6}) \cup (0; \frac{\sqrt{6}}{6})$

90) $\max v [\sqrt{6}; \frac{12}{5}\sqrt{6}]$ $\min v [-\sqrt{6}; -\frac{12}{5}\sqrt{6}]$ rostouci na $(-\sqrt{6}; \sqrt{6})$
 klesajuci na $(-\infty; -\sqrt{6}) \cup (\sqrt{6}; +\infty)$

91) $y' = 4x^6 + 4 \sin x$ $D_f = D_{f'} = \mathbb{R}$

92) a) $y' = 2x \cdot \sin x + (x^2 - 1) \cos x$

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

93) $\ln |2 + \sin x| + C$

94) $\frac{e^x}{2} (\sin x - \cos x) + C$

95) a) $4x + \ln |x| + C$

b) $\frac{1}{3} \sin 3x + \frac{3x^2}{2} + x + C$

c) 1

96) $\ln |x^3 + 1| + C$

97) $\frac{x^2}{2} (\ln x - \frac{1}{2}) + C$

98) $S = \frac{32}{3} = 10 \frac{2}{3}$

99) $V = \pi r^2 h$ $-\frac{\rho_0 g h}{\rho_0}$

100) $p = p_0 \cdot e^{-\frac{\rho_0 g h}{p_0}}$