



TEHNIČKO VELEUČILIŠTE U ZAGREBU
POLYTECHNICUM ZAGRABIENSE
ELEKTROTEHNIČKI ODJEL

MATEMATIKA 1

24. domaća zadaća: **ISPITIVANJE TIJEKA REALNE FUNKCIJE.**

Ispitajte tijek i nacrtajte kvalitativne grafove sljedećih realnih funkcija:

1. $f(x) = x^3 - 3 \cdot x^2 + 4.$

2. $f(x) = x^3 - 3 \cdot x - 2.$

3. $f(x) = -x^3 - 2 \cdot x^2 + 4 \cdot x + 8.$

4. $f(x) = -x^3 + 5 \cdot x^2 - 7 \cdot x + 3.$

5. $f(x) = 3 \cdot x^4 - 4 \cdot x^3.$

6. $f(x) = x^4 + 4 \cdot x^3 + 4 \cdot x^2.$

7. $f(x) = x^4 - 8 \cdot x^3 + 18 \cdot x^2 - 27.$

8. $f(x) = x^4 - 6 \cdot x^3 + 12 \cdot x^2 - 8 \cdot x.$

9. $f(x) = x^4 + 2 \cdot x^3 - 3 \cdot x^2 - 4 \cdot x + 4.$

10. $f(x) = x^4 - 2 \cdot x^3 - 3 \cdot x^2 + 4 \cdot x + 4.$

11. $f(x) = x - \frac{2}{x-1}.$

12. $f(x) = x + 1 - \frac{3}{x-1}.$

13. $f(x) = x - 3 - \frac{6}{x+2}.$

14. $f(x) = x + 6 + \frac{21}{x-4}.$

15. $f(x) = x - 6 + \frac{20}{x+3}.$

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

17. $f(x) = x^2 + x - 3 - \frac{7}{x-1}.$

18. $f(x) = x^2 + 4 \cdot x - 13 - \frac{50}{x+4}.$

19. $f(x) = x + 6 + 3 \cdot \frac{9 \cdot x - 10}{x^2 - 6 \cdot x + 5}.$

20. $f(x) = x + 1 - 2 \cdot \frac{3 \cdot x - 1}{x^2 - x - 2}.$

21. $f(x) = \sqrt{x^2 - 1}.$

22. $f(x) = -\sqrt{4 - x^2}.$

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



TEHNIČKO VELEUČILIŠTE U ZAGREBU
POLYTECHNICUM ZAGRABIENSE
ELEKTROTEHNIČKI ODJEL

MATEMATIKA 1

24. domaća zadaća: **ISPITIVANJE TIJEKA REALNE FUNKCIJE.**

$$24. f(x) = \frac{x^2}{\sqrt{x^2 - 9}}.$$

$$25. f(x) = -\frac{x^2 + 1}{\sqrt{4 - x^2}}.$$

$$26. f(x) = \sqrt[3]{8 - x^3}.$$

$$27. f(x) = \sqrt[3]{x^3 + 1}.$$

$$28. f(x) = \sqrt{2 \cdot x - x^2}.$$

$$29. f(x) = -x \cdot \sqrt{1 - x^2}.$$

$$30. f(x) = x \cdot \sqrt{x^2 - 9}.$$

$$31. f(x) = x \cdot e^{2 \cdot x}.$$

$$32. f(x) = -x \cdot e^x.$$

$$33. f(x) = e \cdot x \cdot e^{-x}.$$

$$34. f(x) = x^2 \cdot e^x.$$

$$35. f(x) = (x^2 - 6 \cdot x + 11) \cdot e^x.$$

$$36. f(x) = (1 - x) \cdot e^{x-1}.$$

$$37. f(x) = \sqrt{x} \cdot e^x.$$

$$38. f(x) = -\sqrt{-x} \cdot e^x.$$

$$39. f(x) = x \cdot e^{\sqrt{x}}.$$

$$40. f(x) = -x \cdot e^{-\sqrt{x}}.$$

$$41. f(x) = 2 \cdot \frac{x}{e^{2 \cdot x}}.$$

$$42. f(x) = \frac{e^{2 \cdot x}}{2 \cdot x}.$$

$$43. f(x) = -x \cdot e^{-x}.$$

$$44. f(x) = -\frac{e^{-x}}{x}.$$

$$45. f(x) = -\frac{x}{2 \cdot e^{2 \cdot x}}.$$

$$46. f(x) = -\sqrt{\frac{x}{e^{2 \cdot x}}}$$

$$47. f(x) = -\sqrt{-\frac{x}{e^x}}.$$



TEHNIČKO VELEUČILIŠTE U ZAGREBU
POLYTECHNICUM ZAGRABIENSE
ELEKTROTEHNIČKI ODJEL

MATEMATIKA 1

24. domaća zadaća: **ISPITIVANJE TIJEKA REALNE FUNKCIJE.**

48. $f(x) = -\sqrt{\frac{e^x}{x}}$.

49. $f(x) = -\sqrt{-\frac{e^{2x}}{x}}$.

50. $f(x) = x \cdot \ln x$.

51. $f(x) = x \cdot \ln(-x)$.

52. $f(x) = x^2 \cdot \ln x$.

53. $f(x) = (-x)^2 \cdot \ln(-x)$.

54. $f(x) = x \cdot \ln^2 x$.

55. $f(x) = -x \cdot \ln^2(-x)$.

56. $f(x) = (x \cdot \ln x)^2$.

57. $f(x) = -x^2 \cdot \ln[(-x)^2]$.

58. $f(x) = \sqrt{x} \cdot \ln x$.

59. $f(x) = -\sqrt{-x} \cdot \ln(-x)$.

60. $f(x) = -x^2 \cdot \ln \sqrt{x}$.

61. $f(x) = (-e) \cdot \frac{\ln x}{x}$.

62. $f(x) = -\frac{\ln(-x)}{x}$.

63. $f(x) = \frac{\ln \sqrt{-x}}{x}$.

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

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

66. $f(x) = -\frac{\ln x}{\sqrt{x}}$.

67. $f(x) = \frac{x}{\ln x}$.

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

69. $f(x) = -\frac{\sqrt{x}}{\ln x}$.



TEHNIČKO VELEUČILIŠTE U ZAGREBU
POLYTECHNICUM ZAGRABIENSE
ELEKTROTEHNIČKI ODJEL

MATEMATIKA 1

24. domaća zadaća: **ISPITIVANJE TIJEKA REALNE FUNKCIJE.**

70. $f(x) = -\frac{x}{\sqrt{\ln x}}$.

71. $f(x) = -\sqrt[3]{e \cdot x^{2 \cdot x}}$

72. $f(x) = \left(2 + \frac{1}{2} \cdot x^2\right) \cdot \sqrt{e^x}$.

73. $f(x) = x \cdot e^{-x^2}$.

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

75. $f(x) = \ln \frac{\sqrt{x^2+4}-2}{x}$.

76. $f(x) = -\ln \frac{\sqrt{9-x^2}-3}{x}$.

77. $f(x) = -\frac{1}{2} \cdot x^2 \cdot \ln \frac{x}{2}$.

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

79. $f(x) = \ln(1+e^x)$.

80. $f(x) = \ln\left(e + \frac{2}{x}\right)$

81. $f(x) = x \cdot \sin x$.

82. $f(x) = x - \sin x$.

83. $f(x) = x \cdot \cos x$.

84. $f(x) = x + \cos x$.

85. $f(x) = 2 \cdot x + \operatorname{ctg} x$.

86. $f(x) = -x \cdot \operatorname{arctg} x$.

87. $f(x) = \sqrt{\sin x}$.

88. $f(x) = \sqrt{\cos x}$.

89. $f(x) = \sqrt{\sin x \cdot \cos x}$.

90. $f(x) = \sqrt{-\sin \frac{x}{2} \cdot \cos \frac{x}{2}}$

91. $f(x) = \frac{1}{2} \cdot \sin(2 \cdot x) - \cos x$.

92. $f(x) = \cos^2 x - \cos x$.

93. $f(x) = \sin x - \sin^2 x$.

94. $f(x) = \sin(2 \cdot x) \cdot \sin(4 \cdot x)$.



TEHNIČKO VELEUČILIŠTE U ZAGREBU
POLYTECHNICUM ZAGRABIENSE
ELEKTROTEHNIČKI ODJEL

MATEMATIKA 1

24. domaća zadaća: **ISPITIVANJE TIJEKA REALNE FUNKCIJE.**

95. $f(x) = \cos(2 \cdot x) \cdot \cos(4 \cdot x)$.

96. $f(x) = \sin(2 \cdot x) \cdot \cos(4 \cdot x)$.

97. $f(x) = \frac{1}{\cos x - \sin x}$.

98. $f(x) = \ln(\cos x)$.

99. $f(x) = \sin x - \ln(\sin x)$.

100. $f(x) = \operatorname{arctg} x - \ln x$.

101. $f(x) = \operatorname{arcctg}(\ln x)$.

102. $f(x) = x - 2 \cdot \operatorname{arctg} x$.

103. $f(x) = e^{\cos x}$.

104. $f(x) = e^{\operatorname{arcctg} x}$.

105. $f(x) = e^{\arccos \sqrt{x}}$.

106. $f(x) = \operatorname{arsh} \left(x + \frac{1}{x} \right)$.

107. $f(x) = \operatorname{arth}(x + 1)$.

108. $f(x) = -\operatorname{arth}(x - 1)$.

109. $f(x) = (-x)^x$.

110. $f(x) = -\sqrt[x]{x}$.