**“Beynəlxalq İqtisadiyyat Məktəbi”**

**Xətti cəbr və riyazi analiz**

1. Test for symmetry with respect to each axis and to the origin of the following function

2. Find the points of intersection of the graphs of the equations:

3. Find an equation of the line that passes through the point and has the indicated slope. Then sketch the line

4. Plot the two points and find the slope of the line passing through them

5. Find any intercepts of the following function

6. Find an equation of the line that passes through the points. Then sketch the line

7. Find equations of the lines passing through the given point (….$)$ and having the following characteristics

8. Find equations of the lines passing through the given point $(….)$ and having the following characteristics

9. Find the domain and range of the function

10. Given the functions $f\left(x\right)=1-x^{2}$ and $g\left(x\right)=2x+1$, evaluate the composite function $g(f\left(x\right))$.

11. Estimate the limit of the function

12. Find the limit if it exists

13. Estimate the limit of the function

14. Estimate the limit of the function

15. Find the limit of the expression

16. Find the $x$-values (if any) at which $f$ is not continuous. Which of the discontinuities are removable?

17. Determine the intervals on which the function is continuous

18. Determine the values of $b$ and $c$ such that the function is continuous on the entire real number line.

19. Use the Intermediate Value Theorem to show that $f\left(x\right)=2x^{3}-3$ has a zero in the interval $[1,2]$. Approximate the zero of the function with the accuracy $ε=0.2$5.

20. Find the derivative of the function by the limit process (using the definition of the derivative)

21. Describe the $x$-vAalues at which the function is differentiable and find its derivative

22. Use the rules of differentiation to find the derivative of the function

23. Sketch the graph of the function $f\left(x\right)=4-|x-2|$. Determine

.

24. Find the slope of the graph of the function at the given point $(1,1)$

25. Find an equation of the tangent line to the graph of the function $f(x)$ at the given point $(-1,-2)$

26. Find the derivative of the function

27. Find the second derivative of the function

28. Find equations for the tangent line and the normal line to the graph of the equation at the given point $(….)$

29. Find the absolute extrema of the function on the closed interval $[0,4]$

30. Find all values of $c$ in the open interval $(a,b)$ such that $f^{'}\left(c\right)=0$ if

31. Apply the Mean Value Theorem to find all values of $c$ in the open interval $(a,b)$ such that $f^{'}\left(c\right)=\frac{f\left(b\right)-f(a)}{b-a}$ if

32. Identify the open intervals on which the function is increasing or decreasing

33. Identify all relative extrema of the function

34. Find the limit at positive infinity of the function

35. Find the limit at negative infinity of the function

36. Find the point on the graph of the function

where the tangent line has the greatest slope, and the point where the tangent line has the least slope.

37. Find the indefinite integral

38. Find the particular solution that satisfies the first-order differential equation and the initial condition

39. Find the particular solution that satisfies the second-order differential equation and the initial conditions

40. Use the properties of summation to evaluate the sum

41. Use upper and lower sums to approximate the area of the region using the given number of subintervals of equal width

42. Use the limit process to find the area of the region bounded by the graph of the function and the $x$-axis over the given interval

43. Use the limit process to find the area of the region bounded by

44. Find the antiderivative of the function

45. Find the average value of the function over the given interval and all values of $x$ in the interval for which the function equals its average value

46. Find the indefinite integral

47. Use integration by parts to find the indefinite integral

48. Find the indefinite integral using substitution

49. Use L’Hôpital’s Rule to evaluate the limit

50. Use L’Hôpital’s Rule to evaluate the limit at infinity

51. Determine whether the improper integral diverges or converges. Evaluate the integral if it converges

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53. Solve the following system of linear equations using the Gaussian elimination procedure

54. Solve the following system of linear equations using the Gauss-Jordan elimination procedure

55. Solve the following homogeneous system of linear equations

56. Given the two matrices, find their product. Show that the product of two matrices is not commutative

57. Compute the product $ABC$ of the following three matrices. Show that the product of three matrices is associative

58. Given the matrix $A$ find the product $AA^{T}$. Is the product a symmetric matrix?

59. You are given a matrix several elements of which are not known. Find the appropriate values for the unknowns to make the matrix symmetric

60. Determine the inverse of the matrix if it exists

61. Solve the following system of equations using the inverse of the coefficient matrix

62. Determine all the minors and cofactors of the following matrix

63. Evaluate the determinant of the following matrix using elementary row or column operations

64. Evaluate the determinant of the following $4×4$ matrix using expansion by cofactors

65. Solve the following equation for the variable $x$

66. Determine whether the following matrices are singular or not

67. Prove that if $A$ and $B$ are square matrices of the same size, with $A$ being singular, then $AB$ is also singular. Is the converse true?

68. Determine which of the following matrices are invertible

69. Determine whether or not the following system of equations has a unique solution

70. Determine values of $λ$ for which the following system of equations has nontrivial solutions. Find the solutions for each value of $λ$

71. Show that the following set of three vectors in $R^{3}$ is linearly independent

72. Consider three functions $f,g$, and $h$ of the vector space of polynomials of degree less than or equal to 2. Show that the set of functions $\left\{f,g,h\right\}$ is linearly independent, where

73. Determine the rank of the matrix

74. Find the eigenvalues and eigenvectors of the second-order matrix

75. Find the maximum eigenvalue and corresponding eigenvector of the third-order matrix