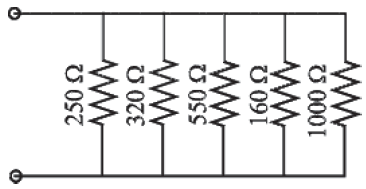
1. funksiyaning -3 ≤ *x* ≤ 3 va -3 ≤ *y* ≤ 3 sohalardagi 3D sirt grafigini tuzing. **(10 ball)**
2. funksiyani -6 ≤ *x* ≤ 6 . sohadagi grafigini chizing. Funksiya ikkita nuqtada vertikal asimptotaga ega ekanligini unutmang (*x1* = -2 va *x2* = 3 da). Funksiya grafigini, x o'zgaruvchisining diapazonini uch qismga bo'lish orqali chizing: birinchisi -6 dan chap asimptotagacha, ikkinchi qismi ushbu ikki asimptota o'rtasida va uchinchisi o'ng asimptotadan 6 gacha. Y o'qi diapazonini -20 dan 20 gacha o'rnating. O’qlarni belgilang va grafikga sarlavha bering. **(10 ball)**
3. N yil davomida umumiy F summasini to'plash uchun yillik foiz stavkasi r bo'lgan hisobvaraqqa o'tkazilishi kerak bo'lgan depozit hisobvarag'iga oylik P omonatini quyidagi formula yordamida hisoblash mumkin:

Yillik foiz stavkasi 4,35% bo'lsa, 5, 6, 7, 8, 9 va 10 yil davomida 100 000 dollarni to'plash uchun oylik omonat miqdorini hisoblang. Natijalarni ikkita ustunli jadvalda ko'rsating, bu erda birinchi ustun yillar soni, ikkinchi ustun oylik omonat hisoblanadi. **(10 ball)**

1. *n* ta musbat *x1, x2, … , xn* sonlar to’plamining o’rtacha garmonik H qiymati quyidagi formula bilan bilan aniqlanadi:

Sonlar to’plamining o’rtacha garmonik qiymatini hisoblaydigan maxsus funksiyani tuzing.. Funksiya nomi va argumentlari uchun **H=Harmean(x)** dan foydalaning, bu yerda kirish argumenti **x** sonlardan iborat vektor (istalgan uzunlikdagi), va **H** – chiqish argumenti – sonlar to’plamining o’rtacha garmonik qiymati. Elektronikada parallel ulangan rezistorlarning ekvivalent qarshiligi, rezistorlar soniga bo'lingan qarshiliklarning harmonik o'rtacha qiymatiga teng. Rasmda ko’rsatilgan rezistorlarning ekvivalent qarshiligini hisoblash uchun **Harmean** maxsus funksiyasidan foydalaning. **(15 ball)**

1. x = [4.5 5 -16.12 21.8 10.1 10 -16.11 5 14 -3 3 2] vektori berilgan. Shartlar va sikllardan foydalanib, x ning elementlarini eng kichikdan kattagacha tartibda joylashtiradigan dastur tuzing. MATLAB ning ichki funksiyasi *sort* dan foydalanmang. **(25 ball)**

**1-savol**

**% Define the range of x and y values**

**x = linspace(-3, 3, 50);**

**y = linspace(-3, 3, 50);**

**% Create a grid of x and y values**

**[X, Y] = meshgrid(x, y);**

**% Calculate the corresponding Z values**

**Z = (X.^2)/3 + 2\*sin(3\*Y);**

**% Create a new figure window**

**figure;**

**% Use the surf function to create the 3D surface plot**

**surf(X, Y, Z);**

**% Add labels to the x, y, and z axes**

**xlabel('x');**

**ylabel('y');**

**zlabel('Z');**

**% Add a title to the plot**

**title('3D Surface Plot of Z = x^2/3 + 2sin(3y)');**

**% Add a colorbar to show the mapping of Z values to colors**

**colorbar;**

**% Add a grid for better visualization (optional)**

**grid on;**

**2-savol**

**% Define the function**

**f = @(x) (x.^2 - 4\*x - 5) ./ (x.^2 - x - 6);**

**% Define the x ranges, avoiding the asymptotes at -2 and 3**

**x1 = linspace(-6, -2.1, 100);**

**x2 = linspace(-1.9, 2.9, 100);**

**x3 = linspace(3.1, 6, 100);**

**% Calculate the y values for each x range**

**y1 = f(x1);**

**y2 = f(x2);**

**y3 = f(x3);**

**% Create a new figure**

**figure;**

**% Plot the function in three parts**

**plot(x1, y1, 'b');**

**hold on;**

**plot(x2, y2, 'r');**

**plot(x3, y3, 'g');**

**% Set the x-axis range**

**xlim([-6 6]);**

**% Set the y-axis range**

**ylim([-20 20]);**

**% Add labels to the axes**

**xlabel('x');**

**ylabel('f(x)');**

**% Add a title to the plot**

**title('Graph of f(x) = (x^2 - 4x - 5) / (x^2 - x - 6)');**

**% Add a legend**

**legend('Part 1 (-6 to -2)', 'Part 2 (-2 to 3)', 'Part 3 (3 to 6)');**

**% Optional: Add vertical lines to mark the asymptotes**

**plot([-2 -2], ylim, 'k--');**

**plot([3 3], ylim, 'k--');**

**hold off;**

**3-savol**

**% Given values**

**F = 100000; % Future value**

**r\_annual = 4.35; % Annual interest rate**

**r = r\_annual / 100;**

**years = 5:10;**

**% Display header**

**disp('-------------------------');**

**disp(' Years | Monthly Deposit ');**

**disp('-------------------------');**

**% Calculate and display monthly deposit for each year**

**for N = years**

**monthly\_rate = r / 12;**

**number\_of\_periods = 12 \* N;**

**P = F \* monthly\_rate / ((1 + monthly\_rate)^number\_of\_periods - 1);**

**fprintf(' %2d | $%8.2f \n', N, P);**

**end**

**% Display footer**

**disp('-------------------------');**

**4-savol**

**function H = Harmean(x)**

**% Harmean: Calculates the harmonic mean of a vector of numbers.**

**% H = Harmean(x) returns the harmonic mean of the elements in the vector x.**

**n = length(x);**

**sum\_of\_reciprocals = sum(1./x);**

**H = n / sum\_of\_reciprocals;**

**end**

**% Resistances of the resistors connected in parallel (from the image)**

**resistances = [250, 320, 550, 160, 1000]; % in Ohms**

**% Calculate the equivalent resistance using the Harmean function**

**equivalent\_resistance = Harmean(resistances);**

**% Display the result**

**fprintf('The equivalent resistance of the parallel resistors is: %.2f Ohms\n', equivalent\_resistance);**

**5-savol**

**% Given vector**

**x = [4.5 5 -16.12 21.8 10.1 10 -16.11 5 14 -3 3 2];**

**n = length(x);**

**% Selection sort algorithm**

**for i = 1:n-1**

**min\_val = x(i);**

**min\_idx = i;**

**for j = i+1:n**

**if x(j) < min\_val**

**min\_val = x(j);**

**min\_idx = j;**

**end**

**end**

**% Swap the current element with the minimum element found**

**temp = x(i);**

**x(i) = x(min\_idx);**

**x(min\_idx) = temp;**

**end**

**% Display the sorted vector**

**disp('Sorted vector x:');**

**disp(x);**