

Name of Course : CBCS B.A. (Prog.)  
 Unique Paper Code : 62353327\_LOCF  
 Name of Paper : SEC-Computer Algebra System  
 Semester : III  
 Duration : 2 hours  
 Maximum Marks : 38 Marks

*Attempt any four questions. All questions carry equal marks.*

Q1. Form the following grid using appropriate functions

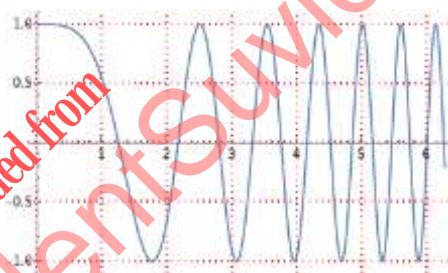
1	1	1	1
2	4	8	16
3	9	27	81
4	16	64	256
5	25	125	625

Each column is right aligned.

Graph each of the functions

- $g(x, y) = 19\cos(x) + \sin(\sqrt{7}x), -20 \leq x \leq 20$
- $2x + 1, 1 - x^2, 1 - x - x^2/3, -2 \leq x \leq 2$

Q2.



Create the above plot of  $f(x) = \cos(x^2)$ ,  $0 \leq x \leq 2\pi$ , with thick, red and dotted grid lines. Change the code so that the grid lines appear only at  $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$  and  $y = .1, .3, .5, .7, .9$

Compute each expression.

- $3^8 \bmod 7$
- $5^{10} \bmod 11$

Q3. Write the command to define a polynomial

$$f(x) = x(x^2 + y^2) - a(x^2 - y^2)$$

Plot it in  $-a \leq x \leq a$ . Write a syntax to solve

$$g(x) = 3x^3 - 16x^2 + 23x - 6$$

and find the numerical solution of  $g(x) = 0$ .

Q4. Give the syntax to find the derivative of  $f(x) = \frac{1}{(1+4x^2)\sqrt{1+3x^2}}$  with respect to x, then evaluate

$$\int_0^{\infty} \frac{1}{(1+4x^2)\sqrt{1+3x^2}} dx$$

and write a command to compute:

$$\sum_{p=0}^{100} (p+2)^5$$

Q5. Find the minimum value of the function  $f(x) = x^{2/3}$  and write syntax for it also. Find the extreme point of the function  $g(t) = 9t^2 + 2t + 4$  and also plot the given function.

Q6. Generate a 9×9 matrix whose i, j th entry is  $i^2+2ij$  by using Table command. Also write syntax to get the fifth column of the matrix. Find the trace of the matrix.

downloaded from  
StudentSuvidha.com