

Sheet (1)

Find the value of these problems:

- $3*2+1$
- $3+1*2$
- $2**2-4*25+3/2$
- $2.0/1$
- $3/2$
- $3.0/2$
- $15/3*2-21/7/3+1$
- $28/2**2+5$
- $3.0/2.0$
- $3*3-27/3$

Sheet (2)

Write a program that reads three real numbers and assigns the appropriate value of true or false to the following logical variables:

TRIANG: true if three real numbers can represent lengths of the sides of a triangle, and false otherwise. (The sum of any two of the numbers must be greater than the third).

EQUIL: true TRIANG is true and the triangle is equilateral (three sides are equal).

ISOS: true TRIANG is true and the triangle is isosceles (at least two sides are equal).

SCAL: true TRIANG is true and the triangle is scalene (no two sides are equal).

The output from your program should have a format like the following:

FOR A = 2.000, B = 3.000, C = 3.000

TRIANG IS: T

EQUIL IS: F

ISOS IS: T

SCAL IS: F

Sheet (3)

1. Write a program to compute moments of inertia (I_x & I_y) of rectangular sections of width (B) and height (D).

2. Write a program to compute the area of a triangle from the lengths of its members by using the following equation :

$$A = \sqrt{P(P - A)(P - B)(P - C)}$$

Where: p = half of parameter, and A, B, C = lengths of members.

3. Write a program to calculate the maximum bending moment, maximum shear force, and maximum deflection in a simple beam subjected to uniformly distributed load (w).

Where: L = span of the beam

$b.t$ = cross section of the beam

E = modulus of elasticity of beam material

4. If the member A,B and C of a triangle are given write a computer program to show if the angle in front of the member C is a right angle or greater than or less of 90, let the output be:

If the angle = 90 let computer write (C is a right angle).

If the angle > 90 let computer write (C is > 90).

If the angle < 90 let computer write (C is < 90).

Sheet (4)

1. Write a segment of a program to compute the following series:

$$y = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots$$

Neglecting all terms less than 10^{-3}

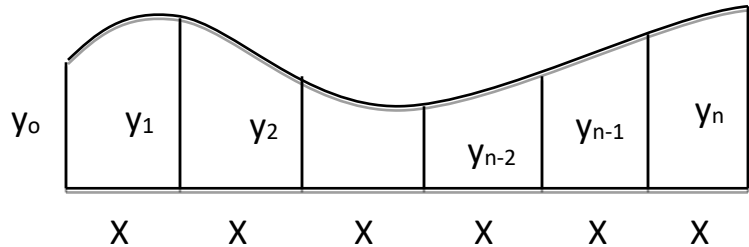
2. Write a program to compute the area under the curve using Simpson's rule:

$$A = \frac{x}{3} [y_0 + 2(y_2 + y_4 + \dots + y_{n-2}) + 4(y_1 + y_3 + \dots + y_{n-1}) + y_n]$$

Where:

n is even number

x internal distance



3. Write a program to compute the product of matrices

$$C(m * p) = A(m * n) \times B(n * p)$$

4. Write a program to compute area of plaster for any number of rooms,

Given:

(L & W) Length and width of the room/s.

(nd & nw) Number of doors and number of windows.

(Ad & Aw) Areas of doors and windows.

(h) Height of floor.

Output should take the form:

Room ID	no.	Dim.	H	nd	Ad	nw	Aw
--	--	-- * --	--	--	--	--	--

Blank line

Area of wall's plaster = ---- m²

Area of roof's plaster = - - - - m²

Sheet (5)

Write a complete FORTRAN program as if you are writing it in a file in the computer to read two data and variable X and Y, then calculate the following function:

$$F(X, Y) = \begin{cases} 1 + \sqrt{1 + X^2} + \frac{X}{y} & \text{if } X < 5 \quad \text{and} \quad Y > 0 \\ 1 - \sqrt{1 + X^2} + X^y & \text{if } X < 5 \quad \text{and} \quad y < 0 \\ 5 & \text{if } \quad \quad \quad \text{otherwise} \end{cases}$$

Then print the value of the function.

Sheet (6)

Write a program that reads values for the coefficients A, B, C, D, E, and F of the equations:
 $Ax + By = c$ & $Dx + Ey = F$ of two straight lines.

Then determine whether the lines are parallel (slopes are equal) or intersect, and if they intersect, if the lines are perpendicular (product of slopes = -1)

The output should be as follows:

Lines are parallel: Yes or No

Lines are intersecting: Yes or No

Lines are perpendicular: Yes or No