L5 MATHEMATICS ASSIGNMENTS

16) Give that $f(x) = \frac{1}{2}x^2e^{x+1}$

a) Find the domain of $f(x)$, **(1 marks)**
b) Find relative asymptotes (if any), **(4 marks)**
c) Study the first and second derivative with variation table, **(8 marks)**
d) Sketch the curve of $f(x)$. **(2 marks)**

02. Given the function **f(x)=** $\frac{1}{x-2}$**+2**

a) Find domain of definition and boundary limits **4marks**
b) Find asymptotes to the curve **2marks**
c) Compute the first derivative and study its sign **2marks**
d) Compute the second derivative and study its sign **2marks**
e) Find the variation table **2marks**
f) Sketch the graph of the curve in Cartesian plane **3marks**

3. Given the function $f(x) = e^x - 1$

a. Find the domain of definition of f(x) [**1mark**]
b. Find Asymptotes to the curve [**2marks**]
c. Find the limits at boundaries of domain of definition [**2marks**
d. Compute the first derivative and study its sign [**2marks**]
e. Compute the second derivative and study its sign [**2marks**]
f. Make a variation table [**2marks**]
g. Find intercept points with the axes [**2marks**]
h. Sketch the graph of the function [**2marks**]

04. Given the function $f(x) = \ln(2x+3)$:

a) Find the domain of definition of f (x) [3marks]
b) Calculate limit at boundaries of the domain of definition; [3marks]
c) Find both x and y –intercepts; [3marks]
d) Find the first derivative of f (x) and its table of signs; [3marks]
e) Find the second derivative of f (x) and its table of signs. [3marks]

05.

Let $f(x) = \frac{x^2-1}{x^2-4}$

a) Determine the domain of definition of this function **(2marks)**
b) Calculate the limits around the boundaries of the domain found in a) and deduce the equations of all possible asymptotes. **(2marks)**
c) Find the coordinates of intersection points of the asymptotes to the curves. **(1mark)**
d) Study the variations and draw the variation table **(7marks)**
e) Sketch the graph of the curve representing *f*. **(3marks)**