

SOLVE THE FOLLOWING QUESTIONS**1. Evaluate each of the following integrals**

(a) $\int \cosh^3 x \, dx$ (4 Marks)

(b) $\int \frac{(1+x)e^x}{\sin^2(xe^x)} \, dx$ (4 Marks)

(c) $\int \left(\frac{\ln x + \sin(\ln x)}{x} \right) dx$ (4 Marks)

a) $\int \cosh^2 x \cosh x \, dx$

2.(a) Evaluate $\int x \tan^{-1} x dx$

(4 Marks)

(b) Evaluate $\int_0^3 x^5 \sqrt{1+x^2}$

(4 Marks)

1. (a) Evaluate $\int \frac{x^2 + 2x - 10}{2x^3 + 5x^2 + 2x} dx$

(5 Marks)

(b) Show that the volume of a sphere of radius r is $V = \frac{4}{3}\pi r^3$

(5 Marks)

(a) Show that the following equation is homogeneous and solve it $\frac{dy}{dx} = \frac{x+y}{x-y}$ (5 Marks)

(b) Show that the following equation is exact and solve it.

$$2xydx - (x^2 - 1)dy = 0$$

(5 Marks)

g) Sketch the following parabola and determine the vertex, the focus, the directrix, the axis, the length of latus rectum and its ends $x^2 = 12(y-1)$ (5 Marks)

h) Show that the curve $x^2 - y^2 - 4x + 8y - 28 = 0$ is a hyperbola. Sketch the hyperbola and show the foci, vertices and asymptotes. (5 Marks)

انتهت الأسئلة مع دعواتي لكم بالتوفيق د/أحمد قمر