

السؤال الأول. 40 درجة

$$I_1 = \int x e^x dx :$$

بالجزئية $u = x$ و $dv = e^x dx$ (5)
 $du = dx$
 (5) $v = e^x$
 $I = u \cdot v - \int v \cdot du$

$$I_2 = \int \frac{1}{x^2 - 3} dx$$

$$I = \int \frac{1}{(x - \sqrt{3})(x + \sqrt{3})} dx = \int \frac{A}{(x - \sqrt{3})} + \int \frac{B}{(x + \sqrt{3})} dx$$

$$I_3 = \int \frac{dx}{\sin x} \quad (10) \quad dx = \frac{2dt}{t^2 + 1} \quad \begin{matrix} x \rightarrow \frac{\pi}{2} \\ t = \tan \frac{x}{2} \end{matrix}$$

Sin x

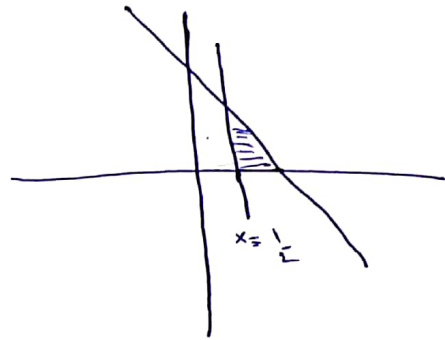
$$I_4 = \int \frac{dx}{x \sqrt{x^2 + 9}}$$

(10)

$$= \int \frac{dx}{x (x^2 + 9)^{\frac{1}{2}}} = \int \dots$$

اد سوال الثاني : 20 درج

$$I_1 = \iint dx dy = \int [x]$$



$$I_1 = \iint dx dy = \int_{\frac{1}{2}}^1 \int_0^{1-x} dy dx$$

$$I_2 = \iint \frac{dx dy}{\sqrt{x^2 + y^2 + 1}}$$

$$x^2 + y^2 = r^2$$

اد سوال الثالث : 10 درج

$$I_3 = \int_0^2 \int_x^{\sqrt{x}} \frac{x}{x^2 + y^2} dy dx$$

$$(10) = \int_0^2 \left[\arctan \frac{y}{x} \right]_1^{\sqrt{x}} dx$$

المعادلة الثالثة - 3 درجات

$$(1) \quad y'' + y = e^x \Rightarrow y'' + y = 0$$

$$\frac{dy}{dx} = -y \Rightarrow \frac{dy}{y} = -dx$$

$$(5) \quad y = e^{-x} \Leftrightarrow \ln y = -x$$

$$y = c e^{-x}$$

(5) ↓

$$(2) \quad y'' + y' + y = 0$$

$$(10) \quad r^2 + r + 1 = 0$$

$$(2) \quad y = \frac{x^2 + y^2}{x^2 + xy}$$

مجانة

(10)

