

\* حلول واجبات صفحة (4) :-

$$1) \int (\sqrt{3^x}) dx$$

$$= \int (3^x)^{\frac{1}{2}} dx = \int 3^{\frac{1}{2}x} dx$$

$$= \frac{3^{\frac{1}{2}x}}{\frac{1}{2} \ln 3} + C = \frac{2\sqrt{3^x}}{\ln 3} + C$$

$$2) \int (\sqrt{2^{x+1}}) dx =$$

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

$$= \frac{2^{\frac{1}{2}(x+1)}}{\frac{1}{2} \ln 2} + C = \frac{2\sqrt{2^{x+1}}}{\ln 2} + C$$

$$3) \int_0^2 (3 - 5^x)^2 dx$$

الحل: فك الشرح

$$= \int_0^2 (9 - 6 \cdot 5^x + 5^{2x}) dx$$

$$= 9(2-0) - 6 \frac{5^x}{\ln 5} \Big|_0^2 + \frac{5^{2x}}{2 \ln 5} \Big|_0^2$$

$$= 18 - \frac{6}{\ln 5} (5^2 - 5^0) + \frac{1}{2 \ln 5} (5^4 - 5^0)$$

$$= 18 - \frac{6}{\ln 5} (25 - 1) + \frac{1}{2 \ln 5} (625 - 1)$$

$$= 18 - \frac{144}{\ln 5} + \frac{312}{\ln 5} = 18 + \frac{168}{\ln 5}$$

$$\boxed{3} \int \frac{x^4 - 16}{2x} \cdot dx$$

$$\int \left( \frac{x^{4-3}}{2x} - \frac{16}{2x} \right) \cdot dx$$

$$\int \left( \frac{1}{2} x^3 - \frac{8}{x} \right) \cdot dx$$

$$\frac{1}{2} \cdot \frac{x^4}{4} - 8 \ln|x| + C$$

$$\frac{1}{8} x^4 - 8 \ln|x| + C$$

$$\boxed{4} \int \frac{e^x + 1}{e^x} \cdot dx$$

$$\int \left( \frac{e^x}{e^x} + \frac{1}{e^x} \right) \cdot dx$$

$$\int (1 + e^{-x}) \cdot dx$$

$$x + \frac{e^{-x}}{-1} + C$$

$$x - \frac{1}{e^x} + C$$

$$\therefore \frac{5}{3} \text{ واجب } *$$

$$\boxed{1} \int \frac{dx}{5 - \frac{x}{3}}$$

$$\int \frac{1}{\frac{15-x}{3}} \cdot dx : \text{حل أول} *$$

$$\int \frac{3}{15-x} \cdot dx$$

$$= 3 \ln|15-x| + C$$

$$\int \frac{1}{5 - \frac{x}{3}} \cdot dx : \text{حل ثاني} *$$

$$\frac{\ln|5 - \frac{x}{3}|}{-\frac{1}{3}} + C$$

$$= -3 \ln|5 - \frac{x}{3}| + C$$

$$\boxed{2} \int \frac{3}{x + x^{-2}} \cdot dx$$

$$\int \frac{3}{x + \frac{1}{x^2}} \cdot dx = \int \frac{3}{\frac{x^3+1}{x^2}}$$

$$\int \frac{3x^2}{x^3+1} \cdot dx = \ln|x^3+1| + C$$

$$\boxed{5} \int \left( \frac{2}{x} - 2^x \right) \cdot dx$$

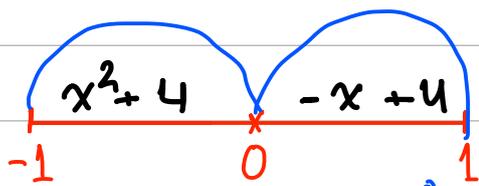
$$2 \ln|x| - \frac{2^x}{\ln 2} + C$$

\* الحل :-

\* واجب ① صفحة (6) :-

$$f(x) = \begin{cases} x^2 + 4, & x < 0 \\ -x + 4, & x \geq 0 \end{cases} \quad \text{لذا كانت}$$

$$\int_{-1}^1 f(x) dx \quad \text{نجد}$$



\* الحل: نعيد تعريف على الجزء

$$\int_{-1}^1 f(x) dx = \int_{-1}^0 f(x) dx + \int_0^1 f(x) dx$$

$$= \int_{-1}^0 (x^2 + 4) dx + \int_0^1 (-x + 4) dx$$

$$= \frac{x^3}{3} \Big|_{-1}^0 + 4(0 - (-1)) + \left(-\frac{x^2}{2}\right) \Big|_0^1 + 4(1 - 0)$$

$$= \frac{1}{3}(0 - (-1)) + 4 + \left(-\frac{1}{2}(1 - 0)\right) + 4$$

$$= \frac{2 \cdot 1}{2 \cdot 3} + \frac{8 \cdot 6}{6} - \frac{1 \cdot 3}{2 \cdot 3}$$

نوجد قيمه مقادير

$$= \frac{2 + 48 - 3}{6} = \frac{47}{6}$$

انتبه  
ووقت عند  
التحويل!!  
(اجزء السالب)

\* واجب (2) صفحة (6) :-

$$\int_2^4 \sqrt{x^2 - 6x + 9} \, dx$$

\* الحل :- نحل ما داخل الجذر

$$\int_2^4 \sqrt{(x-3)(x-3)} \, dx = \int_2^4 \sqrt{(x-3)^2} \, dx$$

$$= \int_2^4 |x-3| \, dx$$

نجد القيمة

الجزء

$$= \int_2^3 (3-x) \, dx + \int_3^4 (x-3) \, dx$$

# الحل :-

$$x-3=0 \rightarrow x=3$$

3-x	x-3
2	3
-	+
3	4

$$= 3(3-2) - \frac{x^2}{2} \Big|_2^3 + \frac{x^2}{2} \Big|_3^4 - 3(4-3)$$

$$= \cancel{3} - \frac{1}{2}(9-4) + \frac{1}{2}(16-9) \cancel{3}$$

$$= -\frac{5}{2} + \frac{7}{2} = \frac{2}{2} = 1$$