- Q. Antiderivative of a periodic function need not be periodic function.
- Eg. $f(x) = \cos x + 1$ is periodic but $\int (\cos x + 1) dx$ = $\sin x + 5$ is a periodic.



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Q. $\int e^{-\ln x^2} dx$

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dx Q. $\sqrt{9-4x^2}$ Preview from Notesale.co.uk Page 56 of 315

Q. find f(x) if

f' $(\sin^2 x) = \cos^2 x$ for all x, f(1) = 1Notesale preview from 60 of 315 preview page

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Q. $\int \frac{(1+x)^2}{x(1+x^2)} dx$ Preview from Notesale.co.uk Preview Page 74 of 315



 $\sqrt{x}+1$ $(x^2-\sqrt{x})$ Q. <u>dx</u> Preview from Notesale.co.uk Preview gage 87 of 315

Q. A function g defined for all positive real number satisfies $g'(x^2) = x^3$ for all x > 0 and g(1) = 1. Compute g(4) uk preview from Notesale preview gage 90 of 315

 $\int \frac{\mathrm{dx}}{25+4x^2}$ Q. Preview from Notesale.co.uk Preview Page 98 of 315

Q. $\int \frac{x^2 + 3}{x^6 (x^2 + 1)} dx$ $\int \frac{x^6 (x^2 + 1)}{x^6 (x^2 + 1)} dx$ $\int \frac{1}{x^6 (x^2 + 1)} dx$ Methods of integration 1. By substitution preview 107 of 107 of

3. Partial fraction

4. Misc. (kuturputur)



Q. $\int \frac{x^2 \tan^{-1} x^3 dx}{1 + x^6}$ Preview from Notesale.co.uk preview from Notesale.page 122 of 315





dx

Q.

 $' \sec x + \csc x$

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Q. $\int \tan(10x) \cdot \tan(7x) \cdot \tan(3x) dx$

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$$\int \frac{dx}{\sqrt{x^2 + a^2}} = \ell n \left(x + \sqrt{x^2 + a^2} \right) \& \int \frac{dx}{\sqrt{x^2 - a^2}} = \ell n \left(x + \sqrt{x^2 - a^2} \right)$$

$$\int \frac{dx}{\sqrt{x^2 + a^2}} = \ell n \left(x + \sqrt{x^2 - a^2} \right) \& \int \frac{dx}{\sqrt{x^2 - a^2}} = \ell n \left(x + \sqrt{x^2 - a^2} \right)$$

$$\int \frac{dx}{\sqrt{x^2 - a^2}} = \ell n \left(x + \sqrt{x^2 - a^2} \right) \& \int \frac{dx}{\sqrt{x^2 - a^2}} = \ell n \left(x + \sqrt{x^2 - a^2} \right)$$

e^xdx Q. $\int \sqrt{e^{2x}} -$ Preview from Notesale.co.uk Page 161 of 315

 $\int \frac{(2x+3)}{(x^2+2x+2)} \, dx$ Q. Preview from Notesale.co.uk Preview from 165 of 315



Examples

Q. $\int \sin^5 x \cos^6 x \, dx$ $\int \sin^5 x \cos^6 x \, dx$ $\int \sin^5 x \cos^6 x \, dx$

Q. $\int \sin^3 x \cos^5 x \, dx$

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Integration By Parts

- Rules :- Notesale.co.uk (i) Choose 2nd Function which is easily integrable
- Choose 1st & 2nd functions such that after by (ii)parts Complexity of 2nd term reduces as compared to original integration
- (iii) Note sometimes 1 is taken as a function

Rules :--

Q. $x \sec^2 x dx$

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 $\int \frac{\cos^{-1}x}{x^3} dx$ Q. Preview from Notesale.co.uk Preview gage 194 of 315



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Q. $\int e^{x} \left(\frac{x}{(1+x)^2} \right) dx$ Preview from Notesale.co.uk Preview 213 of 315

Q. $\int e^x \left[\ell n (\operatorname{seex} + \operatorname{tanx}) + \operatorname{seex} \right] dx$

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 $e^{\tan^{-1}x} (1 + x + x^2)$ Q <u>dx</u> $1 + x^{2}$ Preview from Notesale.co.uk Page 226 of 315

Q. $\int \frac{e^x(x-1)}{(x+1)^3} dx$ Preview from Notesale.co.uk Preview gage 231 of 315

Case II :

Degree of $P_1(x) < Degree of P_2(x)$ (a) P_2 is linear in x For Example $2^3 \times 2^3 \times 2^3 \times 4^2$ $\int \frac{1}{(x-1)(x-2)(x+1)}$ Let $\frac{x^2+2x+4}{(x-1)(x-2)(x+1)} = \frac{A}{x-1} + \frac{B}{x-2} + \frac{C}{x+1}$ $A = \frac{-7}{2}, B = 4, C = \frac{1}{2}$

 $1 + x \cos x$ $\int \frac{1}{x(1-x^2e^{2\sin x})} dx$ Q. Preview from Notesale.co.uk Page 247 of 315

xdx Q. $\int (1-x^4)^{3/2}$ Preview from Notesale.co.uk Preview 252 of 315

Q. $\int \sqrt{x^2 - a^2} \, dx = \frac{x}{2} \sqrt{x^2 - a^2} - \frac{a^2}{2} \ln \left(x + \sqrt{x^2 - a^2} \right) + C$ Preview from Notesale.co.uk Preview gage 261 of 315











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 $\int \frac{x^2 + 1}{x^4 + 7x^2 + 1} \, dx$ Q. Preview from Notesale.co.uk Preview gage 289 of 315

 $\int \frac{x^{17}}{1+x^{24}} dx$ Q. Preview from Notesale.co.uk Preview 293 of 315



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Put $L_1 = t_1^2$ from Notesale.co.uk Preview 307 of 315 Preview 939