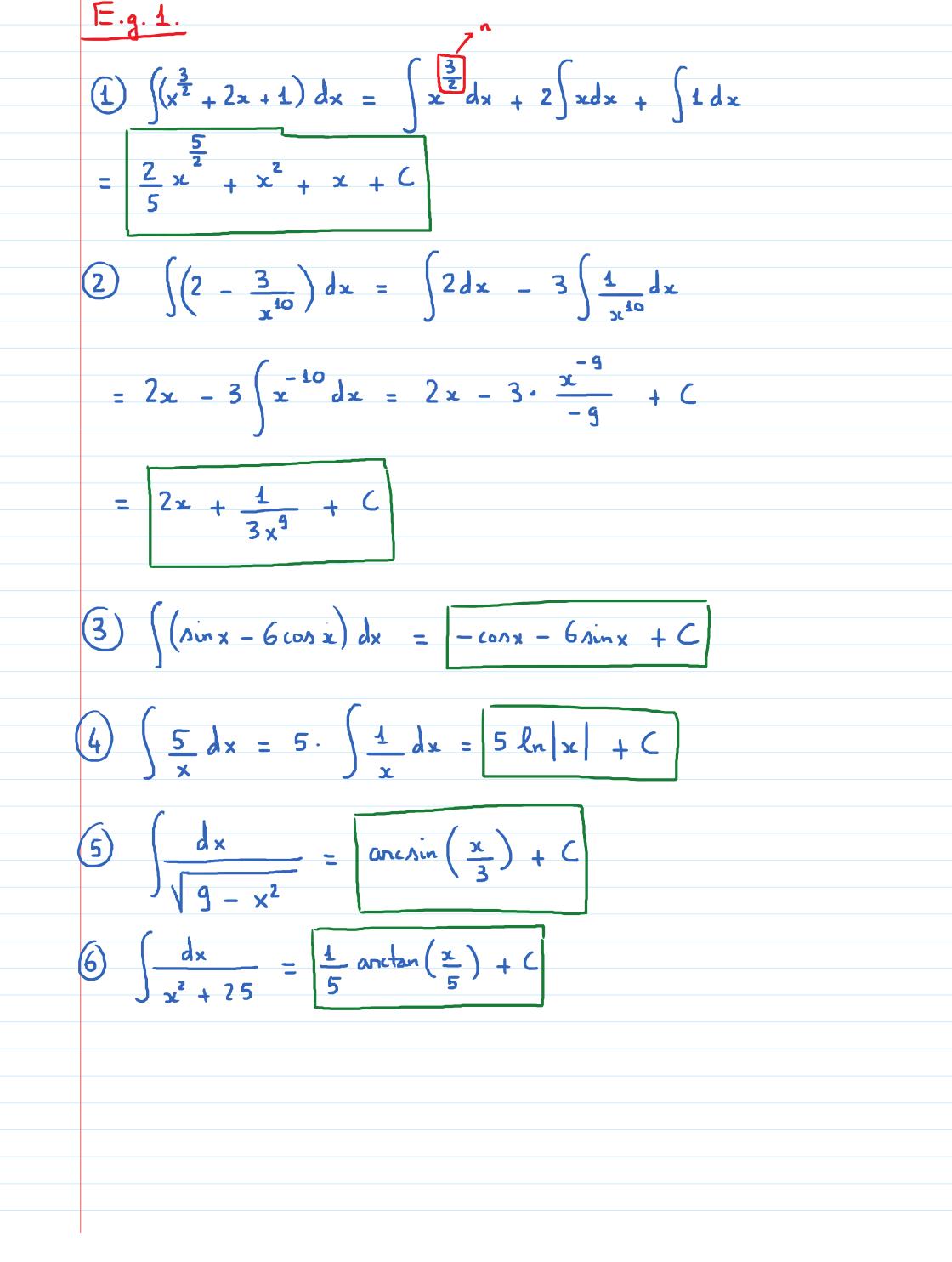
Tuesday, August 27, 2019 1:26 PM Lecture O: Review of Basic Integration Rules k f(x) dx = k f(x) dx $\int \operatorname{sec}(x) \operatorname{tzm}(x) dx = \operatorname{sec}(x) + ($ $\int (sc^2(x)dx = -\cot(x) + C$ $\int \left[f(x) \pm g(x) \right] dx = \int f(x) dx \pm \int g(x) dx$ $\int c_{x}c(x) \cot(x) = -c_{x}c(x) + C$ $\int x^{n} dx = \frac{x^{n+1}}{n+1} + C ; n \neq -1$ $\int \frac{1}{x} dx = ln |x| + C$ Conx dx = sinx + C $\int \sin x \, dx = -\cos x + C$ $\int rec^{2}(x)dx = tan(x) + C$

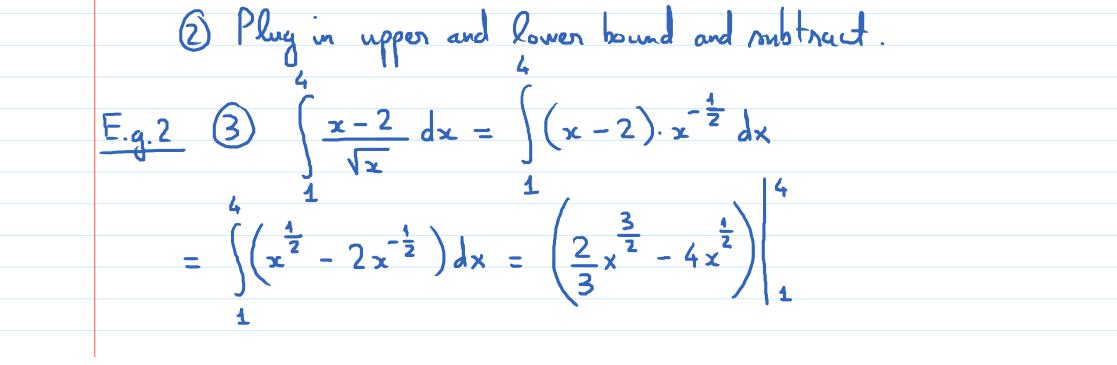
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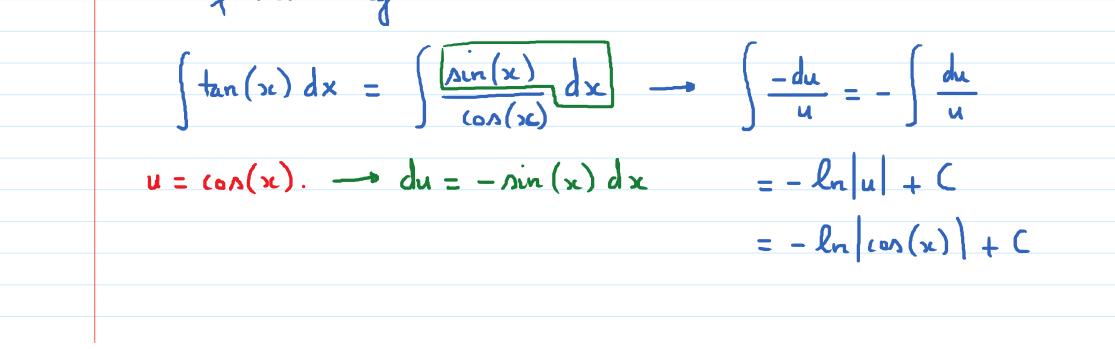
E.g. 2. (1) $\int (x+1)(3x-2)dx$ $= \left(\left(3x^{2} + x - 2 \right) dx = \left| x^{3} + \frac{x^{2}}{2} - 2x + C \right| \right)$ (2) $\int \frac{x^4 - 3x^2 + 5}{x^4} dx$ $= \int \left(x^{4} - 3x^{2} + 5 \right) \cdot x^{-4} dx = \int \left(1 - 3x^{-2} + 5x^{-4} \right) dx$ $= x + 3x^{-1} - \frac{5}{3}x^{-3} + C$ Reminder: Fundamental Theorem of Calculus. $\int_{a}^{b} f(x) dx = F(x) = F(b) - F(a)$ an antiderivative of f(x) To find a définite integral. (1) Antiderivative



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$$\begin{aligned} &= \left[\frac{2}{3}\left(4\right)^{\frac{3}{2}} - 4\left(4\right)^{\frac{1}{2}}\right] - \left[\frac{2}{3}\left(1\right)^{\frac{3}{2}} - 4\left(4\right)^{\frac{1}{2}}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left[\frac{2}{3}\right] \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left(\frac{2}{3}\right) \\ &= \left(\frac{16}{3} - 8\right) - \left(\frac{2}{3} - 4\right) = \left(\frac{2}{3} - 4\right) = \left(\frac{4}{3}\right) \\ &= \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} - \frac{2}{3}\right) \\ &= \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} - \frac{2}{3}\right) \\ &= \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} - \frac{2}{3}\right) \\ &= \left(\frac{1}{3} - \frac{2}{3}\right) = \left(\frac{1}{3} -$$

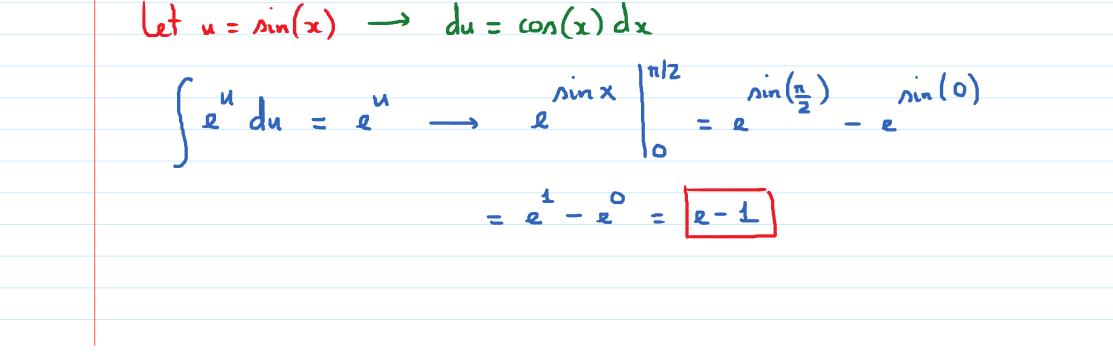
Table of busic integrals:



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$$E_{4}^{(u)} = \frac{1}{\sqrt{2x+1}} dx \qquad x=0: u=2(0)+1=1 \\ x=4: u=2(4)+1=3 \\ lat u=2x+1 \longrightarrow du=2dx \rightarrow dx = \frac{du}{2} \\ f = \frac{1}{\sqrt{u}} \frac{du}{dz} = \frac{1}{2} \int u^{\frac{1}{2}} du = u^{\frac{1}{2}} \int \frac{1}{3} = (9)^{\frac{1}{2}} - (4)^{\frac{1}{2}} \\ f = \frac{1}{2} \end{bmatrix}$$

$$(3) \int \frac{hm(z)}{con^{3}(x)} \frac{du}{dx} = -hn(x) dx \\ -\int \frac{du}{u^{3}} = -\int u^{-3} du = \frac{u^{-2}}{2} + C = \frac{1}{2} (unx)^{-2} + C \\ (4) \int \frac{(lnx)^{2}}{(x)} dx \qquad u = lnx \rightarrow du = \frac{1}{x} dx \\ \int u^{2} du = \frac{u^{3}}{3} + C = \frac{(lnx)^{3}}{3} + C \\ (5) \int z^{nin(x)} con(x) dx \rightarrow du$$



$$f_{ander, hereit (2), 200} = 300 \text{ M}} \qquad x = 0: u = e^{0} = 1$$

$$f_{ander} = e^{x} \longrightarrow du = e^{x} dx$$

$$f_{ander} = anctan(u) = anctan(s) = anctan(s)$$

$$f_{anctan}(s) = \frac{1}{4}$$

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