$= 1/3[\sin 9x + \sin 5x]$

$\int \sin 7x \cos 2x\,dx = 1/2\int(\sin 9x + \sin 5x)\,dx$

$= \frac{1}{2}\left(\frac{-\cos 9x}{9}\right) =$

$-1/2\left(\frac{-\cos 9x}{9} - \frac{\cos 5x}{5}\right)$

$= -1/2\left(\frac{\cos 9x}{9} + \frac{\cos 5x}{5}\right).$

4.) $\frac{(2x-3x^2)}{1-x}$

$f(3x^2-2) = 3x^2-2$

$-1(x-1) \qquad x-1$

$3x+3$

$x-1 \;|\; 3x^2 + 2$

$3x^2 - 3x$

$3x - 2$

$3x - 3$

$\frac{2-3x^2}{1-x}$

$1 \;\; 3x+3$

$1-x \;|\; 2-3x^2$

$3x - 3x^2$

$2 - 3x$

$3 - 3x$

$= 1$

$\int (3x+3)\,dx - \int \frac{1}{1-x} \Rightarrow \frac{3x^2}{2} + 3x - \ln(1-x) + C$

~~GHM 102~~ MAT 104 21/04/2020

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1.) $3te^{2t}$

$u = 3t \qquad dv = e^{2t}$

$du/dt = 3 \qquad v = \frac{e^{2t}}{2}$

$\int 3te^{2t}\,dt = 3t(e^{2t}/2) - \int e^{2t}/2 - 3\,dt$

$\int 3te^{3t}\,dt = \frac{3te^{2t}}{2} - \frac{3e^{2t}}{4}$

2.) $x^2 \sin x$

$u = x^2 \qquad dv = \sin x$

$du/dx = 2x \qquad v = -\cos x$

$= -x^2\cos x + \int \cos x \cdot 2x\,dx$

Let $u = 2x \qquad dv = \cos x$

$du/dx = 2 \qquad v = \sin x$

$= -x^2\cos x + 2x\sin x - \int \sin x \cdot 2\,dx$

$-x^2\cos x + 2x\sin x - \int \sin 2x\,dx$

$-x^2\cos x + 2x\sin x + 2\cos 2x$

3.) $\sin 7x \cos 2x$

$A = 7x, \qquad B = 2x$

$\sin A\cos B = 1/2[\sin(A+B) + \sin(A-B)]$