Muhammad Raihan Maulana 2306216635

QUIZ KALKULUS 2 :

1.) $\frac{dz}{dx}$? b.) $\cot(qx)\cos(z) = x$

$d(\cot(qx)\cos(z)) = dx$

$\cos z \cdot d(\cot qx) + \cot(qx)\, d(\cos z) = dx$

$\cos z \left(-\csc^2 qx\right) dx + \cot qx \left(-\sin z\right) dz = dx$

$-(\cot qx \cdot \sin z)\, dz = \left(1 + q\cos z \csc^2(qx)\right) dx$

$\frac{dz}{dx} = -\frac{1 + q\cos z \cdot \csc^2(qx)}{\cot(qx)\cdot\sin(z)}$ //

$(uv)' = u'v + v'u$

2.) b.) $\int \frac{1}{x^2 - gx}\, dx = \int \frac{A}{x-g} + \frac{B}{x}\, dx$

check $A \cdot x + B(x-g) = 1$

saat $x = 0$ $\quad -gB = 1$, $B = -\frac{1}{g}$

saat $x = g$ $\quad gA = 1$, $A = \frac{1}{g}$

$= \int \frac{1}{g(x-g)}\, dx - \frac{1}{gx}\, dx$

$= \frac{1}{g}\ln|x-g| - \frac{1}{g}\ln|x| + C$ //

$= \frac{1}{g}\ln\left|\frac{x-g}{x}\right| + C$ //

$\int \frac{1}{x-g}\, dx$

$\int \frac{1}{x-g}\, d(x-g)$

$= \ln|x-g|$

Muhammad Raihan Maulana 230621 66[illegible]

3.) $f'(x)$? a.) $f'(x) = \frac{d}{dx}\sin^2(1-x^3)$ → $\frac{d}{dx}$

$= 2(\sin(1-x^3))^{2-1} \cdot \frac{d}{dx}(\sin(1-x^3))$

$= 2 \cdot \sin(1-x^3)\cos(1-x^3)\cdot \frac{d}{dx}(1-x^3)$ → $= d\cos x$

$= 2\sin(1-x^3)\cos(1-x^3)(-3x^2)$

$= -6x^2 \sin(2\cdot(1-x^3))$

$= -6x^2 \sin(2-2x^3)$ //

4.) a.) $\int (x+1)^2\sqrt{2x-1}\,dx$

let $2x-1 = u$

$2x = u+1$

$x = \frac{u+1}{2}$

$u^2 = 2x-1$

$2x = u^2+1$

$x = \frac{u^2+1}{2}$

$u = 2x-1$

$= \sqrt{u}$

$\Leftrightarrow 2x+1 = u \Leftrightarrow 2dx = du \Leftrightarrow dx = \frac{1}{2}du$

$= \frac{1}{2}\int \left(\left(\frac{u+1}{2}\right)+1\right)^2 \sqrt{u}\,du = \frac{1}{2}\int \left(\frac{u^2+2u+1}{4} + \frac{2\cdot(u+1)}{2} + 1\right)\sqrt{u}\,du$

$= \frac{1}{2}\int \left(\frac{u^2}{4} + \frac{u}{2} + \frac{1}{4} + u + 2\right)\sqrt{u}\,du$

$= \frac{1}{2}\int \frac{u^{2,5}}{4} + \frac{3u^{1,5}}{2} + \frac{9u^{0,5}}{4}\,du = \frac{1}{8\cdot 3,5}u^{3,5} + \frac{3}{2\cdot 2,5}u^{2,5} + \frac{9}{4(1,5)}u^{1,5}$

$= \frac{1}{20}u^{3,5} + \frac{3}{5}u^{2,5} + \frac{9}{8}u^{1,5}$

$= \frac{1}{28}(2x+1)^{\frac{7}{2}} + \frac{3}{5}(2x+1)^{\frac{5}{2}} + \frac{3}{2}(2x+1)^{3/2} + C$ //

Muhammad Raihan Maulana 2306216636

No
Date

5.) a) $\int \sin^3(x) \cos^{3/2}(x)\, dx$

$= \int \sin^2(x) \cos^{3/2}(x) \sin x\, dx$

~~$\sin x\, dx =$~~

$d(-\cos x) = -d\cos x$

$= -\int (1 - \cos^2(x)) \cos^{3/2}(x)\, d(\cos x)$

$= -\int \cos^{3/2}(x) - \cos^{7/2}(x)\, d(\cos x)$

$= -\frac{2}{5}\cos^{5/2}(x) + \frac{2}{9}\cos^{9/2}(x) + C$ //