ERRORS FROM MIDTERM 1

The Fundamental Theorem of Calculus states that

If f is continuous on $[a,b]$, then the definite integral of f on the interval $[a,b]$ is denoted by

$$\int_a^b f(x)\,dx = \lim_{n\to\infty}\sum_{i=1}^{n} f(x_i^*)\Delta x \qquad \text{where } a+(i-1)\Delta x \le x_i^* \le a+i\Delta x .$$

$(2t^2)^3 = 2t^5$ *or* $2t^3$ *or* $2t^6$ *or* $16t^6$

$\sqrt{x+4} = \sqrt{x}+2$

$\dfrac{x^2}{\sqrt{x+4}} = \dfrac{x^4}{x+4}$

$(u^2-4)^2 = u^2-8u+16$

$\dfrac{d}{dx}\left(\sqrt{x+4}\right) = \dfrac{x+4}{2}$

$\int (u^2-4)^2\,du = \dfrac{(u^2-4)^3}{3}+C$

$\int \left(u^2-8u+16\right)du = 2u-8+C$

$\int \dfrac{1}{\sqrt{\sqrt[3]{u}+4}}\,du = \ln\left|\sqrt{\sqrt[3]{u}+4}\right|+C$

$(e^{2x})^2 = e^{4x^2} = 2e^{4x}$

$\left(e^{2x}-1\right)^2 = e^{4x}+2e^{2x}-1$

$\left(e^{4x}-2e^{2x}+1\right)\left(\dfrac{1}{-2e^{2x}}\right) = e^{4x}+1$

$\dfrac{d}{dx}\left(e^{2x}-1\right) = 2e^{2x}-1$ *or* $-2e^{2x}$

$\int \left(e^{4x}-e^{2x}\right)dx = \dfrac{e^{5x}}{5}-\dfrac{e^{3x}}{3}+C$ *or* $4e^{4x}-2e^{2x}+C$

$\int \left(e^{4x^2}-e^{2x}\right)dx = 4x^2e^{4x^2}8x-4xe^2+C$

$\int e^{4x^2}\,dx = \dfrac{e^{4x^2}}{8x}+C$

$\int \dfrac{\left(e^{2x}-1\right)^2}{2e^{2x}}\,dx = \dfrac{1}{2e^{2x}}\int \left(e^{2x}-1\right)^2 dx$

$\sin\dfrac{\pi}{6} = \cos\dfrac{2\pi}{3} = \cos\dfrac{\pi}{3} = \sqrt{2}$

$\int \left(3\cos\dfrac{1}{2}x+\sin 2x\right)dx = 3\sin\dfrac{1}{2}x-\cos 2x+C$ *or* $-\dfrac{3}{2}\sin\dfrac{1}{2}x+2\cos 2x+C$ *or* $\dfrac{3}{2}\sin\dfrac{1}{2}x-2\cos 2x+C$ *or* $-6\sin\dfrac{1}{2}x+\dfrac{1}{2}\cos 2x+C$

$\int \sec x\tan x\,dx = \sec^2 x+C$ *or* $\sec^3 x+\tan^3 x+C$

$\dfrac{3u}{13-u^2} = \dfrac{3u\cdot\left(-u^{-2}\right)}{13} = \dfrac{-3u^{-1}}{13} = \dfrac{-3}{13u}$

$\int \dfrac{6+3x}{9-4x-x^2}\,dx = \dfrac{6x+\dfrac{3}{2}x^2}{9x-2x^2-\dfrac{1}{3}x^3}+C$

$\dfrac{d}{dx}e^{2x} = 2xe^{2x}\cdot 2$ *or* $\dfrac{1}{2}e^{2x}$

$\dfrac{d}{dx}4xe^{2x} = 8x^2e^{2x}\cdot 2$