87.5

CALCULUS II
QUIZ 2 B 3RD PARTIAL

Name Laura M. Londoño Hidalgo ID A01570224 DATE: 20/April/2018

LATE

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. (12.5 pts each one)

Evaluate the integral.

1) $\int 4xe^x\,dx =$

$1\int xe^x dx = \begin{matrix} u=x & dv=e^x \\ du=1 & v=e^x \end{matrix}$ $xe^x - \int e^x(1) = 1\left[xe^x - e^x\right] = 4xe^x - 4e^x + C$

1) A

A) $4xe^x - 4e^x + C$ B) $xe^x - 4e^x + C$ C) $4e^x - e^x + C$ D) $4e^x - 4xe^x + C$

2) $\int e^{5x}\cos 4x\,dx$

$\begin{matrix} u=\cos 4x & dv=e^{5x} \\ du=\frac{\sin 4x}{4} & v=\frac{e^{5x}}{5} \end{matrix}$ $\frac{\cos 4x\,e^{5x}}{5} - \int\left[\frac{e^{5x}}{5}\right]\left[\frac{\sin 4x}{4}\right] = \frac{1}{20}$ $\begin{matrix} u=c^{5x} & dv=\sin 4x \\ du=\frac{e^{5x}}{5} & v=-\frac{\cos 4x}{4} \end{matrix}$ 2) D C

A) $\frac{e^{5x}}{2}[\sin 4x + \cos 4x] + C$ B) $\frac{1}{41}[4e^{5x}\sin 4x + 5\cos 4x] + C$

12.5 C) $\frac{e^{5x}}{41}[4\sin 4x + 5\cos 4x] + C$ D) $\frac{e^{5x}}{41}[4\sin 4x - 5\cos 4x] + C$

3) $\int (2x-1)\ln(24x)\,dx$

$\begin{matrix} u=\ln 24x & dv=2x-1 \\ du=\frac{24}{24x}=\frac{1}{x} & v=x^2-x \end{matrix}$ $\ln 24x\left[x^2-x\right] - \int\left[x^2-x\right]\left[\frac{1}{x}\right] = x-1$ $\frac{x^2}{2}+x$

3) A

A) $\left(x^2 - x\right)\ln 24x - \frac{x^2}{2} + x + C$ B) $\left(x^2 - x\right)\ln 24x - \frac{x^2}{2} + 2x + C$

C) $\left(\frac{x^2}{2} - x\right)\ln 24x - \frac{x^2}{4} + x + C$ D) $\left(x^2 - x\right)\ln 24x - x^2 + x + C$

4) $\int 23x\cos\frac{1}{2}x\,dx$ ($u = 23x$, $dv = \cos\frac{1}{2}x$)

$+\ 23x \to \cos\frac{1}{2}x$
$-\ 23 \to 2\sin\frac{1}{2}x$
$+\ 0 \to -4\cos\frac{1}{2}x$

$= 46x\sin\frac{1}{2}x + 92\cos\frac{1}{2}x$

4) B

A) $23x\sin\left(\frac{1}{2}\right)x - 46\cos\left(\frac{1}{2}\right)x + C$ B) $46x\sin\left(\frac{1}{2}\right)x + 92\cos\left(\frac{1}{2}\right)x + C$

C) $92\sin\left(\frac{1}{2}\right)x - 46x\cos\left(\frac{1}{2}\right)x + C$ D) $23\sin\left(\frac{1}{2}\right)x + 46x\cos\left(\frac{1}{2}\right)x + C$

5) $\int e^{2x}x^2\,dx = \frac{x^2e^{2x}}{2} - \frac{xe^{2x}}{2} + \frac{e^{2x}}{4} + C$

5) B

A) $(1/2)x^2e^{2x} - (1/4)xe^{2x} + (1/4)e^{2x} + C$ B) $(1/2)x^2e^{2x} - (1/2)xe^{2x} + (1/4)e^{2x} + C$

C) $(1/2)x^2e^{2x} - (1/2)xe^{2x} + C$ D) $(1/2)x^2e^{2x} - xe^{2x} + (1/4)e^{2x} + C$

$\frac{1}{20}$

$\cos 4x \quad dv=e^{5x}$
$\frac{\sin 4x}{4} \quad v=\frac{e^{5x}}{5}$
$= \cos 4x\left[\frac{e^{5x}}{5}\right] - \int\left[\frac{e^{5x}}{5}\right]\left[\frac{\sin 4x}{4}\right] = \frac{\cos 4x\,e^{5x}}{5} - \int\frac{e^{5x}\sin 4x}{20} = \frac{\cos 4x\,e^{5x}}{5} - \frac{1}{20}\left[\sin 4x\left[\frac{e^{5x}}{5}\right] - \int\left[\frac{e^{5x}}{5}\right]\right.$

$u=\sin 4x \quad dv=e^{5x}$

$\frac{1}{20}\left[\frac{\sin 4x\,e^{5x}}{5} + \frac{1}{20}\left[\int e^{5x}\cos 4x\right]\right] = \frac{\cos 4x\,e^{5x}}{5} - \frac{\sin 4x\,e^{5x}}{5} + A\left[\frac{1}{20}\right]$ $\begin{matrix} du=\frac{-\cos 4x}{4} & v=\frac{e^{5x}}{5} \end{matrix}$

A

$20A + A = \frac{\cos 4x}{5}$ $\frac{\cos 4x\,e^{5x}}{4} - \frac{e^{5x}\cos 4x}{80} + \frac{A}{10} =$

QUIZ 2: THIRD PARTIAL CORRECTIONS

Evaluate the integral

② $\int e^{5x}\cos 4x\,dx$ (A) $u=\cos 4x \quad dv=e^{5x}$ $du=-4\sin 4x \quad v=\frac{1}{5}e^{5x}$

$= \frac{e^{5x}\cos 4x}{5} + \frac{1}{5}\int e^{5x}\sin 4x\,dx$ ← integrate

$= \frac{e^{5x}\cos 4x}{5} + \frac{4}{5}\left[\frac{e^{5x}\sin 4x}{5} - \int \frac{e^{5x}}{5}\cos 4x\right] = \frac{e^{5x}\cos 4x}{5} + \frac{4e^{5x}\sin 4x}{25} - \frac{4}{5}\left[\frac{1}{5}\right]\int e^{5x}\cos 4x\,dx$ → A

$A + \frac{16}{25}A = \frac{e^{5x}\cos 4x}{5} + \frac{4e^{5x}\sin 4x}{25} \quad \frac{41A}{25} = \frac{e^{5x}\cos 4x}{5} + \frac{4e^{5x}\sin 4x}{25}$ ← multiply by inverse

common factor

$A = \frac{25}{41}\left[\frac{e^{5x}\cos 4x}{5} + \frac{4e^{5x}\sin 4x}{25}\right] = \frac{e^{5x}}{41}\left[5\cos 4x + 4\sin 4x\right] + C$ ← letter ©