Name: _____

MATH 200 – QUIZ 13 Shift ⇑

I'm in the Thurs11 Thurs12 Thurs1 or Fri10 recitation. (Circle one)

December 7, 2012

1. $\frac{d}{dx}\left[\int_3^x e^{4r}\,dr\right] =$ e^{4x} (By F.T.C. I)

Alternative $\frac{d}{dx}\left[\int_3^x e^{4r}dr\right] = \frac{d}{dx}\left[\left[\frac{1}{4}e^{4r}\right]_3^x\right] = \frac{d}{dx}\left[\frac{e^{4x}}{4} - \frac{e^{12}}{4}\right]$

$= \frac{1}{4}e^{4x}(4) - 0 = \boxed{e^{4x}}$

2. $\int_1^4 x^{-\frac{1}{2}}\,dx =$ $\left[\frac{x^{1/2}}{1/2}\right]_1^4 = \left[2\sqrt{x}\right]_1^4$

$= 2\sqrt{4} - 2\sqrt{1} = 4 - 2 = \boxed{2}$

3. $\int 6\theta\cos(3\theta^2)\,d\theta =$ $\int \cos(3\theta^2)\,6\theta\,d\theta = \int \cos u\,du = \sin u + C$

$= \boxed{\sin(3\theta^2) + C}$

$u = 3\theta^2$

$\frac{du}{d\theta} = 6\theta$

$du = 6\theta\,d\theta$

Name: _____

MATH 200 – QUIZ 13 Esc

I'm in the Thurs11 Thurs12 Thurs1 or Fri10 recitation. (Circle one)

December 7, 2012

1. $\left[\frac{d}{dx}\int_4^x (z^2+5)^2\,dz\right] =$ $\boxed{(x^2+5)^2}$ (By F.T.C. I)

2. $\int_{-\pi/6}^{\pi/6} \tan x \sec x\,dx =$ $\left[\sec(x)\right]_{-\frac{\pi}{6}}^{\pi/6} = \sec\left(\frac{\pi}{6}\right) - \sec\left(\frac{-\pi}{6}\right) = \frac{1}{\cos(\pi/6)} - \frac{1}{\cos(-\frac{\pi}{6})}$

$= \frac{2}{\sqrt{3}} - \frac{2}{\sqrt{3}} = \boxed{0}$

3. $\int 12s^2\sqrt{4s^3+15}\,ds =$ $\int (4s^3+15)^{1/2}\,12s^2\,ds$

$= \int u^{1/2}\,du = \frac{u^{3/2}}{3/2} + C = \frac{2\sqrt{u}^3}{3} + C$

$= \boxed{\frac{2\sqrt{4s^3+15}^3}{3} + C}$

$u = 4s^3 + 15$

$\frac{du}{ds} = 12s^2$

$du = 12s^2\,ds$

Name: _____ MATH 200 – QUIZ 13 Ctrl Alt Del

I'm in the Thurs11 Thurs12 Thurs1 or Fri10 recitation. (Circle one) December 6, 2012

1. $\frac{d}{dx}\left[\int_1^x \cos(2t)\,dt\right] =$ $\cos(2x)$ (By FTC I)

Alternative: $\frac{d}{dx}\left[\int_1^x \cos(2t)\,dt\right] = \frac{d}{dx}\left[\left[\frac{1}{2}\sin(2t)\right]_1^x\right] = \frac{d}{dx}\left[\frac{1}{2}\sin(2x) - \frac{1}{2}\sin(2)\right]$

$= \frac{1}{2}\cos(2x)\,2 - 0$

$= \cos(2x)$

2. $\int_0^1 x(x^2+1)\,dx = \int_0^1 (x^3+x)\,dx = \left[\frac{x^4}{4} + \frac{x^2}{2}\right]_0^1$

$= \left(\frac{1^4}{4} + \frac{1^2}{2}\right) - \left(\frac{0^4}{4} + \frac{0^2}{2}\right) = \frac{1}{4} + \frac{1}{2} = \frac{3}{4}$

3. $\int \frac{4y}{2y^2-6}\,dy = \int \frac{1}{2y^2-6}\,4y\,dy = \int \frac{1}{u}\,du = \ln|u| + C = \ln|2y^2-6| + C$

$u = 2y^2 - 6$

$du = 4y\,dy$

Name: _____ MATH 200 – QUIZ 13 Enter

I'm in the Thurs11 Thurs12 Thurs1 or Fri10 recitation. (Circle one) December 6, 2012

1. $\frac{d}{dx}\left[\int_2^x \frac{2s^3}{s+1}\,ds\right] =$ $\frac{2x^3}{x+1}$ (By FTC I)

2. $\int_{\pi/4}^{3\pi/4} \cot x \csc x\,dx = \left[-\csc x\right]_{\pi/4}^{3\pi/4} = -\csc\left(\frac{3\pi}{4}\right) - \left(-\csc\left(\frac{\pi}{4}\right)\right)$

$= \frac{-1}{\sin\left(\frac{3\pi}{4}\right)} + \frac{1}{\sin\left(\frac{\pi}{4}\right)} = \frac{-1}{\frac{\sqrt{2}}{2}} + \frac{1}{\frac{\sqrt{2}}{2}} = 0$

3. $\int e^{2r^2} 4r\,dr = \int e^u\,du = e^u + C = e^{2r^2} + C$

$u = 2r^2$

$\frac{du}{dr} = 4r$

$du = 4r\,dr$