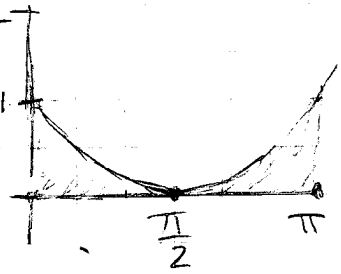
Mat 131 Day 6

P374

#24 $\int_{-\pi/4}^{7\pi/4} (\sin x + \cos x)\,dx = -\cos x + \sin x \Big|_{-\pi/4}^{7\pi/4}$

$= \left(-\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right) - \left(-\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right) = \boxed{0}$

yes it is consistent w/ picture – Net Area = 0



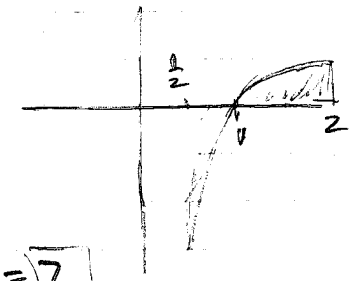
#42 $\int_0^{\pi} (1 - \sin x)\,dx = x + \cos x \Big|_0^{\pi} = (\pi - 1) - (0 + 1)$

$= \boxed{\pi - 2}$

#28 $\int_{1/2}^{2} (1 - x^{-2})\,dx = x + x^{-1} \Big|_{1/2}^{2}$

$= (2 + 1/2) - (1/2 + 2)$

$= \boxed{0}$



#36 $\int_0^{\ln 8} e^x\,dx = e^x \Big|_0^{\ln 8} = e^{\ln 8} - e^0 = 8 - 1 = \boxed{7}$

#38 $\int_0^4 x(x-2)(x-4)\,dx = \int_0^4 x^3 - 6x^2 + 8x\,dx = \frac{x^4}{4} - 2x^3 + 4x^2 \Big|_0^4$

$= (64 - 128 + 64) - (0)$

$= \boxed{0}$

#40 $\int_0^{1/2} \frac{dx}{\sqrt{1-x^2}} = \arcsin x \Big|_0^{1/2} = \arcsin 1/2 - \arcsin 0$

$= \frac{\pi}{6} - 0 = \boxed{\pi/6}$

#46 $\int_4^9 \frac{x - x^{1/2}}{x^3}\,dx = \int_4^9 x^{-2} - x^{-5/2}\,dx$

$= -x^{-1} + \frac{2}{3} x^{-3/2} \Big|_4^9$

$= -\frac{1}{x} + \frac{2}{3x^{3/2}} \Big|_4^9$

$= \left(-\frac{1}{9} + \frac{2}{81}\right) - \left(-\frac{1}{4} + \frac{2}{24}\right) = \frac{13}{162} \approx .0802$

#4 $\int_0^2 \sec^2\left(\frac{\pi x}{8}\right) dx = \frac{8}{\pi} \tan \frac{\pi x}{8} \Big|_0^2 = \frac{8}{\pi}\left[\tan \frac{\pi}{4} - \tan 0\right]$

$= \frac{8}{\pi}[1 - 0] = \frac{8}{\pi}$ (≈ 2.546)