MA 119 HW #11

Section 7.1 #10, 14, 34, 60

7.2 #7

7.1 #10 $\int 5x^2 - 6x + 3\,dx = \frac{5}{3}x^3 - \frac{6}{2}x^2 + 3x + C$

$= \frac{5}{3}x^3 - 3x^2 + 3x + C$

7.1 #14 $\int t^{1/4} + \pi^{1/4}\,dt = \frac{4}{5}t^{5/4} + \pi^{1/4}t + C$ ($\pi^{1/4}$ is a constant)

7.1 #34 $\int \frac{2y^{1/2} - 3y^2}{6y}\,dy = \int \frac{2y^{1/2}}{6y} - \frac{3y^2}{6y}\,dy$

$= \int \frac{1}{3}y^{-1/2} - \frac{1}{2}y\,dy = \frac{1}{3}\cdot 2y^{1/2} - \frac{1}{2}\cdot\frac{1}{2}y^2 + C$

$= \frac{2}{3}y^{1/2} - \frac{1}{4}y^2 + C$

7.1 #60

a) $f(t) = \int f'(t)\,dt = \int .01\,e^{-.01t}\,dt = .01\int e^{-.01t}\,dt$

$= .01 \cdot \frac{1}{-.01}e^{-.01t} + C = \underline{-e^{-.01t} + C}$ $\quad f(t) = -e^{-.01t} + C$

b) plug $t=0$, $f(t)=0$: $\quad 0 = -e^{-.01\cdot 0} + C$

$0 = -1 + C \quad C = 1$

so $f(t) = -e^{-.01t} + 1$

so $f(10) = -e^{-.01\cdot 10} + 1 = -e^{-.1} + 1 = .095$

7.2 #7

$$\int \frac{2x+2}{(x^2+2x-4)^4}\,dx$$

$u = x^2+2x-4$

$du = (2x+2)\,dx$

$$= \int \frac{2x+2}{u^4}\,dx = \int \frac{1}{u^4}\cdot(2x+2)\,dx$$

$$= \int u^{-4}\,du = \frac{1}{-3}u^{-3} + C$$

$$= \frac{1}{-3}(x^2+2x-4)^{-3} + C$$