Math 1172 HW #1

Section 4.3 # 39
4.4 # 13
4.5 # 38
5.1 # 3

4.3 # 39

$$\int_1^2 \frac{s^4+1}{s^2}\,ds = \int_1^2 (s^4+1)\,s^{-2}\,ds$$

$$= \int_1^2 s^2+s^{-2}\,ds = \frac{1}{3}s^3 + \frac{1}{-1}s^{-1}\Big|_1^2$$

$$= \frac{1}{3}\cdot 2^3 - 2^{-1} - \left(\frac{1}{3}\cdot 1^3 - 1^{-1}\right)$$

4.4 # 13

$$\int (u+4)(2u+1)\,du = \int 2u^2+10u+4\,du$$

$$= \frac{2}{3}u^3 + 5u^2 + 4u + C$$

4.5 # 38

$$\int_0^1 (3t-1)^{50}\,dt$$

$u = 3t-1$
$du = 3dt$
$\frac{1}{3}du = dt$

$$= \int u^{50}\cdot\frac{1}{3}\,du$$

$$= \frac{1}{3}\int u^{50}\,du = \frac{1}{3}\cdot\frac{1}{51}u^{51} = \frac{1}{3}\cdot\frac{1}{51}(3t-1)^{51}\Big|_0^1$$

$$= \frac{1}{3}\cdot\frac{1}{51}(3\cdot 1-1)^{51} - \frac{1}{3}\cdot\frac{1}{51}(3\cdot 0-1)^{51}$$

5.1 #3

$$\int_0^1 \sqrt{y} - (y^2 - 1)\,dy = \int_0^1 y^{1/2} - y^2 + 1\,dy$$

$$= \frac{2}{3}y^{3/2} - \frac{1}{3}y^3 + y \Big|_0^1$$

$$= \frac{2}{3} - \frac{1}{3} + 1 - (0)$$