Solutions for Test 1

I) a)

$$P_4(x) = 1 - \frac{x^2}{2} + \frac{x^4}{4!} \ .$$

I) b) 13/24. c) Error is bounded by 1/6!

II)a) 1/2, b) e c) -1

III) a) Convergent since $\int_1^\infty xe^{-x^2}\mathrm{d}x$ is convergent.
b) is not convergent, Since

$$\frac{k}{k^2-1} \geq \frac{1}{k}$$

and the harmonic series is divergent.
c) 64/9

IV) a) Does not exist, b) does not exist, c) exists and equals 1.