

CALCULUS MA-1001 FINAL EXAM

Name: _____ Department: _____ ID: _____

(1) (5ps) Find the following integral: $\int_1^4 \frac{dx}{(x-2)^2}$.

(2) (10ps) Use a comparison test to determine if the integral $\int_e^\infty \frac{dx}{\sqrt{x+1} \ln x}$ converges.

(3) (5 ps) For this problem, write the following in the form of partial fractions. **Do not** find the coefficients/constants. $\frac{x^2 + 5x + 2}{(x+1)^3(x^2+1)^2}$.

(4) Find the following indefinite integrals (20 points each).

a) $\int \cos(\ln x) dx$

b) $\int \frac{x}{\sqrt{6x - x^2}} dx$

c) $\int \sec(x)^3 \tan(x)^3 dx$

d) $\int \frac{dx}{1 + \sin(x) + \cos(x)}$