MATH 1004, Section A
Due 1 Nov, 2017 (at the beginning of tutorial)
Total marks: 100

ASSIGNMENT 2

1. Sketch the following functions. For each sketch you must show all your work, and indicate all intercepts, asymptotes, critical points, and points of inflection [20 marks each]

$$f_1(x) = \frac{1}{x^2 - 1}$$

$$f_2(x) = \frac{x}{(x-3)^2}$$

$$f_3(x) = xe^{-x}$$

2. Solve each of the following integrals by substitution [5 marks each]

(a)

$$\int \frac{2}{(2+x)^3}\, dx$$

(b)

$$\int \frac{2x}{\sqrt{1-x^2}}\, dx$$

(c)

$$\int \frac{x}{\sqrt{1-x^4}}\, dx$$

(d)

$$\int \frac{\cos x}{1+\sin^2 x}\, dx$$

(e)

$$\int \frac{\sec^2 x}{1+\tan x}\, dx$$

(f)

$$\int \frac{-\tan x}{\ln(\cos x)}\, dx$$

(g)

$$\int \frac{1}{x(\ln x)^3}\, dx$$

(h)

$$\int x^4 e^{x^5}\, dx$$