KING SAUD UNIVERSITY

Math Department

First Semester 40/41

November 25th 2019

Time 90mn

Math106 Midterm2

Question 1(2+3+3)

a) Find $\lim_{x\to 0}(1+8x^2)^{\frac{1}{x^2}}$

b) Compute the integral $\int e^{4x} sinx dx$

c) Evaluate $\int (sinx)^2 (cosx)^2 dx$

Question 2(3+3+2)

a) Evaluate the integral $\int \frac{\sqrt{x^2-25}}{x} dx$

b) Find $\int \frac{3x^2+7x+2}{(x+1)^2(x+3)} dx$

c) Compute $\int \frac{dx}{\sqrt{x(x+1)+1}}$

Question 3(3+3+3)

a) Find $\int \frac{dx}{x^{1/2}+x^{1/3}}$

b) Does the integral $\int_0^{\infty} \frac{xdx}{1+x^4}$ converge? Find its value if it does.

c) Compute the area of the region bounded by the curves: $y = x^2, y = x - 1$

$y = 0$, and $y = 4$.