Some Review Problems Midterm 1. Math 101. Sections 202 & 203. UBC 2014.

These problems were worked out during the review section of February 20, 2014. Warning, although they cover most topics they for instance do not cover topics like 'work'. Outlines of the solutions are posted separately.

(1) Evaluate $\int \dfrac{1}{x+x^2}\,dx.$

(2) Evaluate $\int_1^2 \dfrac{1}{x+x^2}\,dx.$

(3) Evaluate $\int_{-1}^1 \dfrac{1}{x+x^2}\,dx.$

(4) Evaluate $\int_1^\infty \dfrac{1}{x+x^2}\,dx.$

(5) Find the average value of the function $(\tan x)^{-2}$ on the interval $[\pi/6, \pi/4].$

(6) Evaluate $\dfrac{d}{d\theta} \int_{4+\sin(\theta)}^{3\cos(\theta)} x^2 e^{-x}\,dx.$

(7) Find the area of the ellipse $\dfrac{x^2}{9} + \dfrac{y^2}{16} = 1.$

(8) Find the area of the bounded region between the curves $y^2 = x+6$ and $y = x.$

(9) Find the volume of solid obtained by rotating the bounded region between the curves $y^2 = x+6$ and $y = x$, about the line $x = 5.$

(10) Evaluate $\displaystyle \lim_{n\to\infty} \sum_{i=1}^n e^{(3(\frac{i}{n})+4)} \dfrac{1}{n}.$