Mathematics 1110H – Calculus I: Limits, Derivatives, and Integrals
TRENT UNIVERSITY, Summer 2018

Quizzes

Quiz #1. Wednesday, 9 May. *[10 minutes]*

1. Sketch the line $y = -x + 1$ and the parabola $y = x^2 - 1$. *[2]*
2. Find the coordinates of the points at which the line and the parabola intersect. *[3]*

Quiz #2. Monday, 14 May. *[10 minutes]*

Use the rules for manipulating limits to compute both of the following:

1. $\displaystyle\lim_{x \to 2} \frac{x-1}{x+1}$ *[2.5]* 2. $\displaystyle\lim_{x \to 2} \frac{x^2 - 3x + 2}{x^2 - x - 2}$ *[2.5]* [*Hint:* The two limits are equal.]

Quiz #3. Wednesday, 16 May. *[10 minutes]*

Compute the derivatives of each of the following: 1. $p(x) = 3x^2 - 4x + \pi$ *[1]*

2. $h(x) = xe^{-x}$ *[1]* 3. $g(x) = \dfrac{x^2 - 1}{x^2 + 1}$ *[1.5]* 4. $f(x) = \cos^2\left(x^3\right)$ *[1.5]*

Quiz #4. Wednesday, 23 May. *[10 minutes]*

1. Find the domain and any and all intercepts, intervals of increase and decrease, and maximum and minimum points of $f(x) = x^3 - 3x$. *[5]*

Quiz #5. Wednesday, 30 May. *[10 minutes]*

1. What is the least possible sum of two positive numbers u and w that have a product of 16? *[5]*

Quiz #6. Monday, 4 June. *[10 minutes]*

1. A tank shaped like a rectangular box measures $1\ m \times 1\ m$ at the base and is $2\ m$ high. It is initially empty, but then water is poured into the tank at the rate of $50\ L/m$, and no water is allowed to drain or leak while this is done. How is the level of water in the tank changing at the instant that water in the tank is $1\ m$ deep? *[10 minutes]*

Quiz #7. Wednesday, 6 June. *[12 minutes]*

Compute each of the following integrals: 1. $\displaystyle\int_0^\pi \sin(x)\,dx$ *[1]* 2. $\displaystyle\int \left(x^2 + \pi e^x\right)\,dx$ *[1]*

3. $\displaystyle\int_2^4 (2x+1)\,dx$ *[1]* 4. $\displaystyle\int \sec^2(x)\,dx$ *[1]* 5. $\displaystyle\int_1^e \frac{1}{x}\,dx$ *[1]*

Quiz #8. Monday, 11 June. *[10 minutes]*

1. Compute $\displaystyle\int_{-1/2}^{(\pi-4)/8} \frac{e^{\tan(2x+1)}}{\cos^2(2x+1)}\,dx$. *[5]* NOTE: $\cos\left(\dfrac{\pi}{4}\right) = \sin\left(\dfrac{\pi}{4}\right) = \dfrac{1}{\sqrt{2}}$