Mathematics 1101Y – Calculus I: functions and calculus of one variable
Trent University, 2013–2014

Quizzes

Quix #0. Monday, 9 September, 2013. *[10 minutes]*

1. Find the x- and y-intercepts of the line given by $y = -\frac{1}{2}x + \frac{1}{2}$. *[1]*
2. Find the equation of the line which is perpendicular to the line given by $y = -\frac{1}{2}x + \frac{1}{2}$ and which has the same x-intercept. *[2]*
3. Sketch a graph of the line given by $y = -\frac{1}{2}x + \frac{1}{2}$ and the one that you obtained in answering question 2 above. *[2]*

Quiz #1. Monday, 16 September, 2013. *[10 minutes]*

Do *one* (1) of questions 1 or 2.

1. Find the x- and y-intercepts, and the coordinates of the vertex, of the parabola $y = 2x^2 + 4x$. *[5]*
2. Verify that $\sec(x) - \tan(x) = \dfrac{1}{\sec(x) + \tan(x)}$. *[5]*

Quiz #2. Monday, 23 September, 2013. *[10 minutes]*

1. Let $f(x) = \tan\left(x^2\right)$, where $0 \le x \le \sqrt{\pi/4}$. Find $f^{-1}(x)$. *[5]*

Quiz #3. Monday, 30 September, 2013. *[10 minutes]*

1. Compute $\lim\limits_{x \to 0} \dfrac{(x+1)\sin(x)}{x^3 - x}$. *[5]*

**Quiz #4.** Monday, 7 October, 2013. *[10 minutes]*

1. Use the limit definition of the derivative to compute $f'(x)$ if $f(x) = 2x^2 - 7x$. *[4]*
2. Compute $f'(x)$ in a more sensible way. *[1]*

Quiz #5. Tuesday, 15 October, 2013. *[10 minutes]*

1. Compute $f'(x)$ if $f(x) = \left(1 + x^2\right)\arctan(x)$. *[2]*
2. Compute $g'(x)$ if $g(x) = \cos\left(\sqrt{1 + e^x}\right)$. *[3]*

Quiz #6. Monday, 28 October, 2013. *[15 minutes]*

The interior of a trash compactor has the shape of a rectangular box $3\ m$ high, $1\ m$ long, and $w\ m$ wide. The width w diminishes at a rate of $1\ m/min$ when the trash is compacted. The compactor is turned on with nothing but $6\ m^3$ of water inside it. No water leaks out (until it overflows :-), and you may assume that the water does not slosh about, the surface remaining perfectly level throughout.
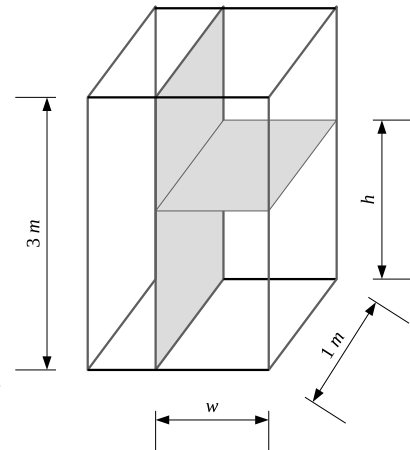
1. How is the height of the water in the trash compactor changing at the instant that $w = 3\ m$? *[5]*

1

Quiz #7. Monday, 4 November, 2013. *[20 minutes]*

1. Find the domain and any and all intercepts, vertical and horizontal asymptotes, intervals of increase and decrease, maxima and and minima, intervals of concavity, and inflection points, of $y = \dfrac{1 - x^2}{1 + x^2}$, and sketch the graph. *[5]*

Quiz #8. Monday, ~~18~~ 25 November, 2013. *[5 minutes]*

1. Sketch the region whose area is computed by $\displaystyle\int_0^2 x\,dx$ and use its shape to find the area. *[5]*

Quiz #9. Monday, 25 November, 2013. *[10 minutes]*

1. Use the Left-hand or the Right-hand Rule to compute $\displaystyle\int_0^2 x\,dx$. *[5]*

Quiz #10. Monday, 2 December, 2013. *[10 minutes]*

1. Compute $\displaystyle\int_0^1 \dfrac{x}{1 + x^2}\,dx$. *[5]*

Quiz #11. Monday, 6 January, 2014. *[10 minutes]*

1. Compute $\displaystyle\int x^2 \ln(x)\,dx$. *[5]*

Quiz #12. Monday, 13 January, 2014. *[12 minutes]*

1. Find the area of the region between $y = x^3 - x$ and $y = 3x$, for $-1 \le x \le 1$. *[5]*

Quiz #13. Monday, 20 January, 2014. *[15 minutes]*

1. Sketch the solid obtained by revolving the region below $y = 2$ and above $y = x$, for $0 \le x \le 2$, about the x-axis, and find its volume. *[5]*

Quiz #14. Monday, 27 January, 2014. *[20 minutes]*

1. Sketch the "ice-cream cone" solid obtained by revolving the region below $y = \sqrt{1 - x^2}$ and above $y = 3x - 3$, for $0 \le x \le 1$, about the y-axis, and find its volume. *[5]*

Quiz #15. Monday, 10 February, 2014. *[10 minutes]*

1. Compute $\displaystyle\int \dfrac{1}{\sqrt{9x^2 + 25}}\,dx$. *[5]*

Quiz #16. Monday, 24 February, 2014. *[15 minutes]*

1. Compute $\displaystyle\int \dfrac{1}{x^3 + x^2}\,dx$. *[5]*

Quiz #17. Monday, 3 March, 2014. *[12 minutes]*

1. Compute $\displaystyle\int_0^\infty \dfrac{2x}{(1 + x^2)^2}\,dx$. *[5]*

Quiz #18. Monday, 10 March, 2014. *[10 minutes]*

1. Compute $\displaystyle\lim_{n \to \infty} \dfrac{\ln(n^n)}{n^2}$. *[5]*

Quiz #19. Monday, 17 March, 2014. *[10 minutes]*

1. Determine whether the series $\displaystyle\sum_{n=1}^{\infty} \frac{1 - \frac{1}{n}}{n^2}$ converges or diverges. *[5]*

Quiz #20. Monday, 24 March, 2014. *[10 minutes]*

1. Determine whether the series $\displaystyle\sum_{n=1}^{\infty} \frac{n(n+1)}{5^{n/2}}$ converges or diverges. *[5]*

Quiz #21. Monday, 31 March, 2014. *[15 minutes]*

1. Find the radius and interval of convergence of the power series $\displaystyle\sum_{n=0}^{\infty} \frac{3^n x^n}{n+1}$. *[5]*