

Mathematics 1101Y – Calculus I: Functions and calculus of one variable
TRENT UNIVERSITY, 2011–2012

Quizzes

Quiz #1. Monday, 19 September, 2011. [10 minutes]

1. Find the intercepts of the parabola $y = x^2 - 2x - 3$, and sketch its graph. [5]

Quiz #2. Monday, 26 September, 2011. [10 minutes]

1. Let $f(x) = 2 \tan(x) - 2$, where $-\frac{\pi}{2} < x < \frac{\pi}{2}$. Find a formula for $f^{-1}(x)$ and graph both $f(x)$ and $f^{-1}(x)$. [5]

Quiz #3. Monday, 3 October, 2011. [10 minutes]

1. Compute $\lim_{x \rightarrow 2} \frac{x^2 - x - 2}{\sqrt{x} - \sqrt{2}}$. [5] *Hint:* $x^2 - x - 2 = (x - 2)(x + 1)$.

Quiz #4. Tuesday, 11 October, 2011. [10 minutes]

1. Explain why $f(x) = \frac{\sin(x)}{x}$ is not continuous at $x = 0$ and determine what kind of discontinuity it has there (removable, jump, or vertical asymptote). [5]

Quiz #5. Monday, 31 October, 2011. [10 minutes]

1. Compute $\frac{dy}{dx}$ if $y = \frac{x^{-1} + x}{e^x}$. [5]

Quiz #6. Monday, 7 November, 2011. [10 minutes]

1. Compute $\left. \frac{dy}{dx} \right|_{(x,y)=(0,0)}$ if $x = \sin(x + y)$. [5]

Quiz #7. Monday, 14 November, 2011. [12 minutes]

1. Puppies S and E are sniffing a fire hydrant when they are startled by a loud noise, and immediately run off in perpendicular directions. S runs South at 9 m/s and E runs East at 12 m/s. How is the distance between the puppies changing 1 s after they hear the noise?

Quiz #8. Monday, 21 November, 2011. [10 minutes]

1. Find the maxima and minima of $f(x) = 4x^3 - 12x$ on the interval $[0, 2]$. [5]

Quiz #9. Monday, 28 November, 2011. [20 minutes]

1. Find the domain and any (and all!) vertical and horizontal asymptotes, local maxima and minima, and points of inflection of $h(x) = \frac{x^2 - 1}{x^2 + 1}$, and sketch its graph. [5]

Quiz #10. Monday, 5 December, 2011. [12 minutes]

1. Compute $\int_1^2 x^2 dx$ using the Right-Hand Rule. [5]

Quiz #11. Monday, 9 January, 2012. [10 minutes]

1. Compute $\int 2 \sin(x) \cos(x) e^{\sin^2(x)} dx$. [5]

Quiz #12. Monday, 16 January, 2012. [10 minutes]

1. Sketch the solid obtained by revolving the region between $y = \frac{1}{3}x$ and $y = 0$ for $0 \leq x \leq 3$ about the x -axis and find its volume. [5]

Quiz #13. Monday, 23 January, 2012. [10 minutes]

1. Sketch the solid obtained by revolving the region between $y = x^2$ and $y = 4$ for $1 \leq x \leq 2$ about the y -axis and find its volume. [5]

Quiz #14. Monday, 6 February, 2012. [10 minutes]

1. Compute $\int \frac{1}{\sqrt{4+x^2}} dx$. [5]

Quiz #15. Monday, 13 February, 2012. [20 minutes]

1. Compute $\int \frac{4}{x^3+4x} dx$. [5]

Quiz #16. Monday, 27 February, 2012. [12 minutes]

1. Find the arc-length of $y = \frac{2}{3}x^{3/2}$ for $0 \leq x \leq 3$. [5]

Quiz #17. Monday, 5 March, 2012. [10 minutes]

1. Compute $\lim_{n \rightarrow \infty} \frac{\arctan(n)}{n^2}$. [5]

Quiz #18. Monday, 12 March, 2012. [10 minutes]

1. Determine whether the series $\sum_{n=1}^{\infty} \frac{n+1}{n^2+2n-1}$ converges or not. [5]