

MATH155 Entrance Exam

31 January 2017

Instructions: Please show all of your work in a neat and consistent way under a labeled header for each problem. Answers with out any work will receive no credit. You are forbidden to use iPads, laptops, tablets, cell phones, graphing calculators or any internet enabled device. The time allotted for this test is a factor, so please stop immediately when time is called.

1. Name:

2. Major:

3. Why did you decide to go to college? What do you think is the purpose of an academic programme at the college level?

4. What do you expect to learn in this course and what do you think you will get out of it?

5. What do you think your final grade in this course will be?

6. Evaluate the following expression: $3((4 - (1 - 5)^2) \div 6)^3 = ?$

7. Sketch the given piecewise function and explicitly label three points for each piece of the domain. $f(x) = \begin{cases} 2^x, & x < 0 \\ \frac{x}{4} + 1, & x \geq 0 \end{cases}$.

8. What is $\cos(\frac{\pi}{4})$

9. Find the limit: $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1}$.

10. Let $f(x) = x^2$ and find the limit: $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$.

11. Find the derivative of $f(x) = 2x - 3x^3$

12. Find the derivative of $f(x) = \cos(x) \cdot (x^2 - 1)$

13. Find the derivative of $f(x) = \frac{\sin^2(x)}{\cos(x)}$

14. Find the derivative of $f(x) = \cos(\sin(2x^2))$

15. Implicitly differentiate $x^2 + xy + y^2 = 0$

16. Find the integral of $\int \ln(x) \frac{dx}{x}$

17. Find the integral of $\int_{-1}^2 \frac{x^4}{2} dx$

18. Find the derivative of $f(x) = x^x$