

University of Lethbridge
Department of Mathematics and Computer Science
MATH 1565 - Tutorial #6: A review!

Print your name and student number clearly in the space above.

Complete the problems on the back of this page to the best of your ability. If there is a problem you especially desire feedback on, please indicate this.

It is recommended that you work out the details on scrap paper before writing your solutions on this page.

1. State the domain and range of $f(x) = \cos^{-1}(x)$.

2. Evaluate the following limits:

(a) $\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x^2 - 16}$

(b) $\lim_{\theta \rightarrow 0} \frac{\tan(5x)}{\sin(3x)}$

3. List all horizontal and vertical asymptotes for the function $f(x) = \frac{5x^3 - 4x + 6}{x^3 - 4x}$.

4. Prove that there exists a real number x such that $\cos(x) = x$. (Hint: IVT)

5. Given $f(x) = \frac{1}{x-3}$, determine $f'(2)$ **using the definition of the derivative**.

6. Evaluate the derivatives of the following functions:

(a) $f(x) = 4x^{11} - 3x^{2/3} + 5\ln(x) + e^\pi$

(b) $g(x) = e^{3x} \cos(5x)$

(c) $h(x) = \frac{x^5 - 4x^3}{x^2}$

(d) $k(x) = \sec(\ln(x^5 + 3x^2))$