# Calculus I (MAC 2311)
# Practice Test 3 Time: 30 minutes

Write your answer for each question in the corresponding box. Only the answer in the box will be graded. Neatly do the work to support your answer in the blank space provided. Each question is worth 1 point. Note: Use of any calculator will be considered as academic dishonesty.

**Name:** _____

**Section and NID/PID:** _____

1. Find the domain and range of the function $f(x) = \sin(\sin^{-1}(x))$.

2. Find the inverse function of $f(x) = \ln(e^x + a)$.

3. Simplify the expression $\sin(\tan^{-1}(x))$.

4. When $f(x) = \dfrac{1}{x+1}$, find the difference quotient $\frac{f(x+h)-f(x)}{h}$

5. The point $P(5, -2)$ lies on the curve $y = 2/(4-x)$. The point $Q$ also lies on this curve with $x$-coordinate equal to 3. Then find slope $m_{PQ}$

6. Find the limit, if it exists: $\lim_{x\to a} \dfrac{|x-a|}{x-a}$.

7. Obtain the point/s of discontinuity, if any, for

$$f(x) = \begin{cases} \pi^x & \text{if } x < 0 \\ x^\pi & \text{if } x \geq 0 \end{cases}$$

8. Obtain the limit, if it exists: $\lim_{h\to 0} \dfrac{\sqrt{64+h}-8}{h}$.

9. Find the number $a$ such that the limit exists. $\lim_{x\to -2} \dfrac{3x^2+ax+a+6}{x^2+x-2}$

10. Suppose a continuous function $f(x)$ obeys the relation $2x-1 \leq f(x) \leq 3x^2-2$ for all $x$, then find $\lim_{x\to 1} f(x)$.