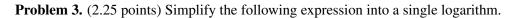
Quiz 11 :(	Name:	
Total Points possible: 10 out of 10	- 100	
Math 12: Spring 2025		

Instructions: Show all your work in order to receive credit.

**Problem 1.** (2.25 points) Consider the functions  $f(x) = x^3 + 1$  and g(x) = 2x - 1. Find g(f(x)) and f(g(x)) and determine if these two functions are commutative.

**Problem 2.** (2.25 points) Are h(x) = x + 2 and j(x) = x + 1002 commutative? Show your claim.



$$\frac{1}{2}\log_3(x^2+1) + \log_3\left(\frac{x+1}{x-1}\right) - \log_3\left(\sqrt{x^2-4}\right)$$

**Problem 4.** (2.25 points) Expand the following expression completely using logarithmic properties.

$$\log_3\left(\frac{(2x^3\sqrt{y})}{(x+2)^2}\right)$$

**Problem 5.** (1 point) Don't look this up. I want your opinion. If I remove an arm from a cactus and plant it, is it considered a new cactus or still part of the original?