College Algebra Weekly Quiz 9 Name:\_\_\_\_\_

No Work  $\Leftrightarrow$  No Points

Use Pencil Only  $\Leftrightarrow$  Be Neat & Organized

1. (5 points) Graph the function  $f(x) = \log_6 x$ , and its inverse, then complete the chart below.



- 2. Use your calculator to find
  - (a) (1 point) log 456

(b) (1 point) ln 1000

(c) (2 points)  $\log_8 8000$ 

(a) \_\_\_\_\_

(b) \_\_\_\_\_

(c) \_\_\_\_\_

3. (5 points) Graph the function  $f(x) = \log_{1/4} x$ , and its inverse, then complete the chart below.



4. (3 points) Solve  $\log_2(3x+2) = 5$ , and check your solution.

4. \_\_\_\_\_

5. (3 points) Solve  $\log_3(\sqrt{x}-1)=2$  , and check your solution.

- 6. (2 points) Use change-of-base formula to evaluate  $\log_7 100$  rounded to three decimal places.
- 7. (3 points) Solve:  $\log_2(3x+5) = 3$

7. \_\_\_\_\_

8. \_\_\_\_

6. \_\_\_\_\_

8. (4 points) Solve:  $\log_2(x^2 - 2x) = 3$ 

9. (4 points) Solve:  $\log_8(x^2 + 7x) = 1$ 

9. \_\_\_\_\_

10. (3 points) Expand and simplify:  $\log_3 81x^2$ 

11. (4 points) Expand and simplify:  $\log_2 \frac{32\sqrt{x}}{y^3}$ 

12. (3 points) Write as a single log:  $3 \log_5 2 + 5 \log_5 x - \frac{1}{5} \log_5 y$ 

**13.** (4 points) Write as a single log:  $3 \log_2 x - \frac{1}{4} \log_2 y - 2$ 

13. \_\_\_\_\_

12. \_\_\_\_\_

11. \_\_\_\_\_

14. (3 points) Find the inverse of  $f(x) = \log_3(x+5)$ .

	15
16. (1 point) Evaluate: 7! + 3!	
17. (2 points) Evaluate: 3! · 5!	16
	17
<b>18.</b> (2 points) Evaluate: $\frac{7!}{3!}$	
9!	18
19. (2 points) Evaluate: $\frac{1}{4! \cdot 5!}$	
	19
<b>20.</b> (2 points) Evaluate: $\frac{12!}{3! \cdot 5! \cdot 4!}$	

22. (3 points) Expand:  $(x+y)^4$ , make sure to box your final answer.

23. (4 points) Expand:  $(x - y)^5$ , make sure to box your final answer.

24. (4 points) Find the first four terms of  $(x^2 - 2y^3)^9$ , make sure to box your final answer.

25. (4 points) Find the 5th term of  $\left(x-y^2\right)^{10}$ 

26. (4 points) Find the 6th term of  $\left(x^3 - y^8\right)^{12}$ 

26. \_\_\_\_\_

27. (4 points) Find the middle term of  $(4x^2 - 5y^6)^{10}$ 

27. \_\_\_\_\_  
28. (2 points) Find the sum: 
$$\sum_{n=1}^{5} n^2$$
  
28. \_\_\_\_\_  
29. (3 points) Find the sum:  $\sum_{n=1}^{4} \frac{1}{n}$ 

30. (4 points) Find the sum:  $\sum_{n=0}^{\infty} \left(\frac{-1}{3}\right)^n$ 

30.\_\_\_\_

31. Consider  $2^n > 2n + 1$ , (a) (1 point) Show that it works for  $n \ge 3$ .

(a) \_\_\_\_\_

(b) (5 points) Use mathematical induction to prove the statement is true for all natural numbers n.