

Math 365-504                      **NEATLY PRINT NAME:** \_\_\_\_\_

Exam 1                                      **STUDENT ID:** \_\_\_\_\_

Fall 2006                                      **DATE:** \_\_\_\_\_

Scarborough                                      **PHONE:** \_\_\_\_\_

**EMAIL:** \_\_\_\_\_

***"On my honor, as an Aggie, I have neither given nor received unauthorized aid on  
this academic work."***

\_\_\_\_\_  
***Signature of student***

***Academic Integrity Task Force, 2004***

<http://www.tamu.edu/aggiehonor/FinalTaskForceReport.pdf>

My signature in this blank allows my instructor to pass back my graded exam in class or allows me to pick up my graded exam in class on the day the exams are returned. If I do not sign the blank or if I am absent from class on the day the exams are returned, I know I must show my Texas A&M student id during my instructor's office hours to pick up my exam. Signature of student \_\_\_\_\_

**WRITE ALL SOLUTIONS IN THE SPACE PROVIDED; FULL CREDIT WILL NOT BE GIVEN WITHOUT CORRECT ACCOMPANYING WORK. FULLY SIMPLIFY ALL ANSWERS AND GIVE EXACT ANSWERS UNLESS OTHERWISE STATED. WHERE PROVIDED, PUT YOUR FINAL ANSWER IN THE BLANK PROVIDED. POINTS WILL BE DEDUCTED FOR SPELLING ERRORS. REMEMBER YOUR UNITS!**

Each fill-in-the-blank problem is worth 5 points.

$a_5 =$  \_\_\_\_\_ 1. If  $a_1 = 3$ ,  $a_2 = 7$ ,  $a_3 = 7$  and for  $n > 3$ ,  $a_n = 4 * a_{n-3} - 6 * a_{n-1}$ , find  $a_5$ .

\_\_\_\_\_ 2. Give a counterexample that illustrates why the natural numbers are not closed under subtraction.

\_\_\_\_\_ 3. Find the contrapositive to the conditional statement, "Five is a whole number, if it is a natural number."

$(g \circ f)(1) =$  \_\_\_\_\_ 4. Given  $f(x) = 3 - 6x$  and  $g(x) = -x^2 + 9$ . Find and simplify  $(g \circ f)(1)$ .

\_\_\_\_\_ 5. What is the next figure in the sequence?

\_\_\_\_\_ 6. Negate "Some figs are not ripe or all spinach is green."

\_\_\_\_\_ 7. A jeans store carries jeans in three rises (low, below waist and above waist). The leg styles are slim, boot, flare, and bell-bottoms. The jean comes in Capri, short, regular, and long. Your color choices are faded, stonewash, dark navy, and tie-dyed. How many slim-leg styles choices are there?

\_\_\_\_\_ 8. Fully simplify  $-4^2 + 90 \div 15 - 2 - 10$ .

9. Let  $S = \{u\}$ ,  $E = \{a, m\}$ , and  $T = \{g, l, a, d\}$ . Given  $U = S \cup E \cup T$ , find the following.

(1pt) a. \_\_\_\_\_ =  $n(\overline{T \cap E})$

(1pt) b. \_\_\_\_\_ =  $T \times S$

(1pt) c. \_\_\_\_\_ =  $S \cup \emptyset$

(1pt) d. \_\_\_\_\_ How many proper subsets does T have?

(1pt) e. \_\_\_\_\_ =  $\overline{(\emptyset)}$

\_\_\_\_\_ 10. What is the sum of the first 5 Fibonacci numbers?

\_\_\_\_\_ 11. Thirteen and nine are whole numbers but  $\frac{13}{9}$  is not a whole number. Use the Division Algorithm to put this problem into the form  $a = bq + r$  where a, b, q, and r are whole numbers.

\_\_\_\_\_ 12. Name a strategy from “devise a plan” in Poyla’s Four Step Problem-Solving Process.

(3pts) 13. You are a teacher. Solve the following problem, step by step, as you would show your students:  $3x - 12 = 9$

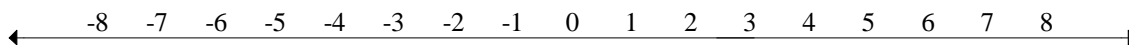
(4pts) 14. Explain the relationships that exist between the four operations: addition, subtraction, multiplication and division.

(5pts) 15. Model the set definition of addition to show  $3 + 2 = 5$ .

(6pts) 16. Find the sum of  $3 + 7 + 11 + 15 + \dots + 147$ .

(4pts) 17. Using blocks or cookies, model  $6 \div 3$ .

(3pts) 18. Model  $7 - 4$  on the number line.



(5pts) 19. Use a model (figure) to illustrate the distributive property of multiplication over addition of whole numbers of 2 ( $3 + 4$ ).

(5pts) 20. Explain, as you would to a student, why you cannot divide zero by zero.

(5pts) 21. Prove why any whole number  $n$  divided by one is  $n$ .