

MA 201 Exam 2

Name:

You may use a non-graphing calculator, but remember to show ALL your work and explain your answers.

1. (a) (12 points) List Polya's Problem-Solving Principles.

(b) For the following problem, use Polya's Problem-Solving Principles to solve. (This means, write each principle and use it in this problem.)

Problem: Samantha has 25 dollars. How many different ways can she make change using 1, 5, and 10 dollar bills?

For questions 2,3, and 4, solve the problem and write down which of the 15 problem-solving strategies you are using.

2. (8 points) A family has 3 children, Ashley, Erin, and William. Every week, each child is assigned a chore, taking out the trash, unloading the dishwasher, or feeding the cats. This week the person who unloads the dishwasher gets into a fight with William and the person who is feeding the cats. Also, Erin is upset because she wanted her chore to be feeding the cats. Who did what chore this week?

3. (a) (10 points) A group students goes to the amusement park, King's Island. Each person gets on one of the 15 rides. How many people must there be in the group so that at least two people ride together?

- (b) How many people must there be in the group so that at least 4 people ride together?

4. (8 points) I am thinking of a number. If you multiply it by 25, add 91, divide that number by 13, and subtract 3, the number is 104. What number am I thinking of?

5. (16 points) For each of the following strategies, create and solve a word problem using the given strategy.

(a) Use a Variable

(b) Find a Pattern

6. (a) (12 points) Give the definition of a prime number.

(b) Give the definition of a composite number.

(c) List the smallest 6 prime numbers.

7. (a) (9 points) Use a factor tree to find the prime factors of 3150.

(b) Give the prime-power representation of 3150.

(c) How many factors does this number have?

8. (a) (12 points) Does 9 divide 527,393,591? How do you know?

(b) Does 6 divide 54,012? How do you know?

(c) What is the divisibility rule for a number being divisible by 4? Give an example of a 9 digit number which is divisible by 4.

9. (a) (13 points) List the three methods you can use to find the greatest common divisor or the least common multiple of two natural numbers.

(b) Choose one of the methods listed above to find $\text{GCD}(540, 3465)$. Specify which method you are using.

(c) Choose one of the methods listed above to find $\text{LCM}(90, 1050)$. Specify which method you are using.

10. (Bonus 5 points) Create a word problem in which you must find either the GCD or the LCM of two natural numbers in order to solve the problem.