

Your Name: \_\_\_\_\_ Room: \_\_\_\_\_  
Grade: \_\_\_\_\_ Teacher: \_\_\_\_\_

Montlake Math Challenge  
Montlake Elementary School  
September 27, 2007

**Instructions:** Try to solve as many problems as you can. You do not need to solve the problems in order, so if you get stuck on one problem, feel free to skip it and work on another one. Please show your work and tell us about how you solved the problem(s). Even if you do not completely solve a problem, we are interested in reading whatever you can turn in.

Do not forget to put your name on every page!

Have fun!

**Question 1.** Simple Simon met a pieman going to the fair. "It costs me two dollars to make a single pie," said the pieman to Simon, "and the fruit filling costs forty cents more than the pie crust." Knowing this, how much does a single pie crust cost? **Answer:** 80 cents

**Question 2.** Jessie has \$5.10 worth of stamps. She has equal numbers of 50-cent, 20-cent, 10-cent, and 5-cent stamps. If she does not have any other stamps, how many 50-cent stamps does she have? **Answer:** 6 stamps

**Question 3.** Bob is going to build a large cube from 25 packages of building blocks. Each package contains 40 blocks, and each block is 1 inch long on each side. How tall is the cube that Bob builds? **Answer:** 10 inches

**Question 4.** Steve and Amir are painting a wall that is 20 feet long. If Steve can paint 5 feet of wall per hour and Amir can paint 3 feet of wall per hour, how long will it take them to paint the wall if they work together? **Answer:** 2.5 hours

**Question 5.** In chess, a rook is a piece that moves across the rows and up or down the columns of the board. Bobby and Gary play a game in which they take turns placing rooks on an  $8 \times 8$  chessboard so that no rook can capture another rook. The player who loses this game is the first player who cannot legally place a rook on the board. If Bobby moves first, which player will win the game? **Answer:** Gary wins

**Question 6.** If I write  $2^3$ , I mean that I multiply 2 by itself three times. This means that  $2^3 = 2 \times 2 \times 2 = 8$  and similarly  $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$ . What is the last (ones) digit of the number  $2^{2007}$ ? (Hint: do not try to compute  $2^{2007}$ !!) **Answer:** 8

**Question 7.** There are 25 students who want to play on Gryffindor's quiddich team. Each of them uses either a Nimbus, Comet, Firebolt, or Cleansweep broomstick. If there are 7 people on a quiddich team, can Professor McGonagall make a team in which each player rides the same type of broomstick? **Answer:** Yes, she can.

**Question 8.** A farmer is out on a walk with his pets: a dog, a cat, and a bird. He comes to a river, and there is a raft that he can use to get across the river. Unfortunately, there is only enough room in the raft for the farmer and one of his pets. He cannot leave his dog and cat alone because they will fight, and he cannot leave the cat alone with the bird because the cat will eat the bird. If the farmer can take the raft back and forth across the river as many times as he wants, can he safely bring all three of his pets across the river?

**Answer:** Yes. First he brings the cat across. He goes back across the river, gets the dog, and brings it across the river. Then he brings the cat back across the river, picks up the bird, and brings it across the river. He leaves the bird with the dog, goes back across the river, and gets the cat.