PIMS Elementary Grades Math Competition NAME: _____
24 May 2003
Sprint Round - Grade Seven Division SCHOOL: _____

1. Alice picks a whole number from 1 to 10 at random, and Bob picks a whole number from 11 to 20 at random. What is the probability that the product of Alice's number and Bob's number is a multiple of 3 ?
Express the answer as a common fraction. _____ 1

2. Andrea is 27 years old and her sister Betty is 6 years younger.
Their father is now three times as old as Betty was 4 years ago.
What will be his age next year ? _____ 2

3. Some kids went on a school ski trip by car, 3 to a car, and the rest went by van, 5 to a van. In total, 140 kids went, using 40 vehicles.
How many kids went by car ? _____ 3

4. The perimeter of square A is 8 cm. If the area of square B is nine times the area of square A, what is the perimeter of square B ? _____ 4

5. M, N, P are positive whole numbers that satisfy: $N = M + M + M$, and $P = N + N$. Find: $\frac{N}{P} + \frac{M}{P}$ = _____ 5

6. Find the last digit of: 3^{2003} . _____ 6

7. How many positive whole numbers smaller than 2003 have 2 as their first digit and 1 as their last digit ? _____ 7

8. A cube of cheese is 4 cm wide, 4 cm long and 4 cm high. Three faces of the cube that meet in a corner are covered with thin layer of wax. The cheese is then cut into 64 small cubes with sides of length 1 cm.
How many of these small cubes have no wax on them ? _____ 8

9. A poster is 40 cm wide. There are two pictures on the poster, each of them 25 cm wide and 20 cm high. Together the pictures take up $1/3$ of the area of the poster. What is the height of the poster (in cm) ? _____ 9

10. Suppose that you have an even number of cards (more than 31). If you put the cards in groups of five, none are left over, but if you put the cards in groups of eleven, then nine are left over. What is the smallest number of cards that you can possibly have ? _____ 10

11. A 1000-seat multiplex cinema building is divided into three theatres. There are 470 seats in the first theatre, and the third theatre has 150 seats less than the second theatre. How many seats are in the third theatre ? _____ 11

12. Calculate: $666^2 - 333^2$ = _____ 12

13. Jamie and Kevin both walk from their house to the park and without stopping, walk back home again. Total walking distance for each one of them is 24 km. Jamie walks twice as fast as Kevin. If both of them leave the house together, what distance will Jamie have walked once he meets Kevin ? _____ 13

14. David wrote eight math tests, all graded out of 100. He calculated his average after six tests, and found that his seventh test raised his average by 2 marks, and his eighth test raised his average by another 2 marks. How many more marks did he get on the eighth test than on the seventh test ? _____ 14

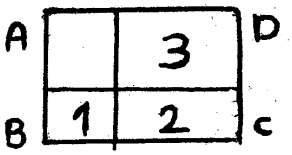
15. Find the largest prime that divides 8118 ? _____ 15

16. A carton of apple juice costs 30 cents. A carton of mango juice costs 50 cents. Alicia bought some cartons of apple juice and some cartons of mango juice, and spent $17.30. Let V be the maximum number of cartons that she could buy and Y be the minimum number of cartons that she could buy. Find: $V - Y$ = _____ 16

17. You are on a game show where there are five questions numbered from 1 to 5 and five possible answers labelled A, B, C, D, and E. To win, the answers must be arranged in a certain order so that every question is answered correctly. If you know the answer to one of the questions but just guess the answers at random for the other four questions, what chance do you have to win ? Express your answer as a common fraction. _____ 17

18. At a rock concert, the stadium is 95% full. There are 19950 people at the concert. How many empty seats are there ? _____ 18

19. A large rectangle ABCD is split into four smaller rectangles. Three of these four rectangles have areas of 1, 2, and 3 units (as shown). What is the area of ABCD ?



_____ 19

20. A rectangle is 12 cm long and 8 cm wide. Find the area (in square centimetres) of the circle that goes through the four corners of the rectangle. Express your answer in terms of π. _____ 20

21. A trucker stopped for gas when her gas tank was $1/8$ full. She bought 40 litres of gas for $30. She then noticed that her tank was only $3/4$ full, so she filled it completely.
How much did she pay for the last $1/4$ tank ? _____ 21

22. Fresh tomatoes are 90% water, but sun-dried tomatoes are only 40% water. How much fresh tomatoes (in kg) is needed to make 5 kg of sun-dried tomatoes ? _____ 22

23 When Beth goes from her house to Whistler, her car uses on average 13 litres of gas every 100 km. On the way back from Whistler, her car averages 11 litres of gas for every 100 km. The entire round trip uses a total of 33 litres of gas. What is the distance in km between Beth's house and Whistler ? _____ 23

24. The digit sum (2+3) of 23 is a multiple of 5, and so is the digit sum (8+7) of 87. How many two digit numbers are there whose digit sum is a multiple of 5 ? _____ 24

25. Let x be a number that: $x + (x+1) + (x+2) + \ldots + (x+8) + (x+9) = 9$.
What is: $x + (x+1) + (x+2) + \ldots + (x+18) + (x+19)$ = _____ 25