PIMS Elementary Grades Math Competition   NAME: _____

5 May 2007

Sprint Round - Grade Five Division   SCHOOL: _____
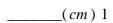
1.   The area of a square is 25 cm^2.

       What is the length of its side (in cm)?   _____(cm) 1

2.   Find the smallest prime number that has a digit sum of 4.   _____ 2

3.   Find: $1^5 + 2^4 + 3^3 + 4^2 + 5^1 =$ _____ 3

4.   You roll a fair die. What is the probability that you roll an even number?

       Express your answer as a fraction.   _____ 4

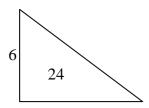5.   Round the following sum to the nearest integer: $7.41 + 7.1$.   _____ 5

6.   Given: $x + 6y = 70$, and $2x = 3y$. Find the value of x.   _____ 6

7.   The diagram shows a right triangle. The length of the smallest side is 6

       and the area is 24. What is the length of the hypotenuse?   _____ 7

8.   Pinko and his dog exercised by running along a straight road.

       They started at Point A and ended at Point B, 1.6 km away.

       The dog's running speed was 2.5 times Pinko's speed. They both

       started at the same time and while Pinko ran once from A to B,

       his dog ran from A all the way to B, and it kept running back and

       forth between Point B and Pinko's position until Pinko finally

       reached Point B. What distance did the dog run (in km)?   _____(km) 8

9.   Simplify to a fraction in lowest terms: $\dfrac{1 + 2 + 3}{2 \times (2 + 4 + 6) + 6}$.   _____ 9
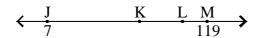
Grade Five (5) Division

10.   In a school the ratio of Grade 5 students to Grade 6 students is $5:6$, and the ratio of Grade 6 students to Grade 7 students is $6:7$. There are 55 students in Grade 5. How many students are there in Grade 7? _____(students) 10

11.   What is the sum of all the distinct prime factors of 2007? _____ 11

12.   What percentage of 140 is 49? _____(%) 12

13.   Ari has 50% more money than Bilha, and Carly has 250% more money than Bilha. Altogether, they have a total of $312. How many dollars does Ari have? _____($) 13

14.   What is the average value of the following list: 7, 1007, 2007, 3007, 4007, and 5007? _____ 14

15.   A shopkeeper received a container of fresh eggs. He sold $\frac{1}{3}$ of the eggs in the morning and sold 320 eggs in the afternoon. At the end of the day he found that $\frac{1}{4}$ of the eggs were not sold. How many eggs did he receive? _____(eggs) 15

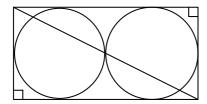16.   On a trip to East Asia, Gilla spent a total of $2000 in the 5 countries she visited. She spent $\frac{1}{5}$ of the total amount in China, $600 in Japan, $480 in Korea, and for every dollar she spent in Thailand she spent 3 dollars in Vietnam. How much money (in dollars) did she spend in Vietnam? _____($) 16

17.   J, K, L, and M are points on the number line as shown. K is the point $\frac{2}{3}$ of the way from J to L. L is the point $\frac{2}{3}$ of the way from K to M. The number located at J is 7, and the number located at M is 119. What number is located at K?

_____ 17

18.   Two congruent circles are tangent to each other as shown. The length of the diagonal of the circumscribing rectangle is 20. What is the area of the rectangle? _____ 18

Grade Five (5) Division

19. Suppose that x and y are positive, and $x \otimes y = 2x^2 + y^2$.
   Given that: $x \otimes y = y \otimes y = 108$, find the value of $x + y$.   _____ 19

20. Working together, 5 men can build a boat in 10 days.
   Working together, 2 women can build the boat in 20 days.
   At the same rates, if 5 men and 4 women work together,
   how many days will it take them to build the boat?   _____(days) 20

21. Kirk has a total of M books, where M is smaller than 40 (M<40). The books are
   on two shelves, Shelf A and Shelf B. Kirk noticed that the ratio of the number of
   books on Shelf A to the number of books on Shelf B was an integer greater
   than 3 but smaller than 10. He moved 7 books from Shelf A to Shelf B,
   and now the new ratio is an integer greater than 1. What is the value of M?_____ 21

22. Suppose that whenever a child is born, the probability is $\frac{1}{2}$ that it is a boy

   and $\frac{1}{2}$ that it is a girl. A family has 5 children. What is the probability that

   at least 3 of them are boys? Express your answer as a fraction.   _____ 22

23. The diagram shows a regular hexagon. The line PQ is parallel to one of the
   sides of the hexagon and ends in two sides, bisecting each one of them.
   What is the ratio of the area of the part of the hexagon "above" PQ to the
   area of the whole hexagon? Express your answer as a common fraction.   _____ 23

24. What is the sum of all the positive numbers
   smaller than 300 and whose digit sum is 2?   _____ 24

25. How many different triangles are there altogether in the diagram?   _____(triangles) 25

26. You have 7 identical marbles and you want to distribute them between 3 jars
   labelled A, B, and C. In how many different ways can you do this?
   Hint: each of the marbles must be placed in one of the jars but
   please remember to also include the possibilities that one or
   more of the jars can be left empty.   _____(ways) 26