PIMS Elementary Grades Math Competition NAME: _____
5 May 2007
Sprint Round - Grade Six Division SCHOOL: _____

1. The area of a rectangle is 55 cm^2. The length of its shorter side is 5 cm. What is the length of its longer side (in cm)? _____(cm) 1

2. Find the smallest prime number that has a digit sum of 8. _____ 2

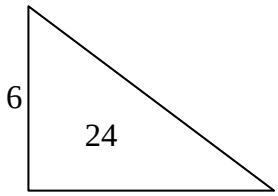
3. Find: $1^5 + 2^4 + 3^3 + 4^2 + 5^1 =$ _____ 3

4. You roll a fair die. What is the probability that you roll a number which is a multiple of 3? Express your answer as a fraction. _____ 4

5. Round the following product to the nearest integer: 3.1×7.99. _____ 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. By how many percent do you have to increase the number 8 to get the number 9? Give your answer in decimal form, correct to one decimal place. _____(%) 8

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

Grade Six (6) 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 90 students in Grade 6. How many students are there in Grades 5, 6, and 7 combined? _____(students) 10

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

12. Pinko and Quinto both cycled a distance of 27 km, starting at the same time. Pinko completed his journey 18 minutes earlier than Quinto. If Pinko's average speed was 18 km/hr, what was Quinto's average speed (in km/hr)? _____(km/hr) 12

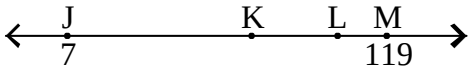
13. Ari has 50% more money than Bilha, and Carly has 250% more money than Bilha. Altogether, they have a total of $312. How many dollars does Ari have? _____($) 13

14. The average of a list of 9 numbers is 2007. You subtract 2007 from one of the numbers. What will be the new average of the list? _____ 14

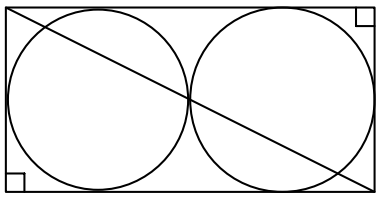
15. A shopkeeper received a container of fresh eggs. He sold $\frac{1}{3}$ of the eggs in the morning and sold 320 eggs in the afternoon. At the end of the day he found that $\frac{1}{4}$ of the eggs were not sold. How many eggs did he receive? _____(eggs) 15

16. On a trip to East Asia, Gilla spent a total of $2200 in the 5 countries she visited. She spent $\frac{1}{4}$ of the total amount in China, $530 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 Six (6) Division

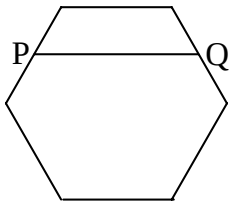
19. Suppose that x and y are positive, and $x \otimes y = 2x^2 + y^2$.
Given that: $x \otimes y = y \otimes y = 108$, find the value of $x + y$. _____ 19

20. Working together, 4 men can build a boat in 10 days.
Working together, 3 women can build the boat in 20 days.
At the same rates, if 2 men and 2 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

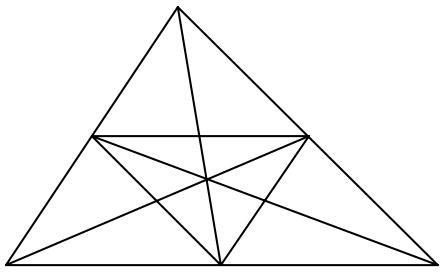
22. Suppose that whenever a child is born, the probability is $\frac{1}{2}$ that it is a boy and $\frac{1}{2}$ that it is a girl. A family has 5 children. What is the probability that exactly 2 of them are boys? Express your answer as a fraction. _____ 22

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 400 and whose digit sum is 3? _____ 24

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



26. You have 10 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