PIMS Elementary Grades Math Competition NAME: _____
29 April 2006
Sprint Round - Grade Six Division SCHOOL: _____

1. Find: $11\times 3+7-\frac{20}{2}-3\times 7=$ _____ 1

2. Dalia is 16 years old. Her twin brothers Eric and Joe are each six years younger than Dalia.
What is the sum of the ages of the three kids ? _____(years) 2

3. In the following equation, $A, B,$ and $C,$ are digits:
$3A6+567=B1C$.
Find the value of $A+B+C$. _____ 3

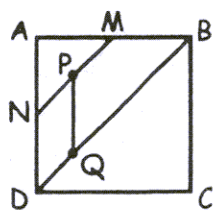
4. A diagonal divides a square into two triangles, each of which has an area of $72\ cm^2$. Find the perimeter of the square (in cm). _____(cm) 4

5. A person writes the word "statistics" over and over again like this:
statisticsstatisticsstatisticsstatisticsstatistics...
What is the 2006-th letter that the person writes ? _____ 5

6. 25% of 60 is equal to 2% of what number ? _____ 6

7. Of 100 students, 76 have brown hair, 58 have brown eyes, and 12 have neither brown hair nor brown eyes.
How many students have both brown hair and brown eyes ? _____(students)7

8. $ABCD$ is a square with sides of 4 units. M and N are midpoints of AB and AD, respectively. P is the midpoint of MN. Q is on the line BD and $PQDN$ is a parallelogram.
What is the area of the trapezoid $BQPM$?



_____$(unit^2)$ 8

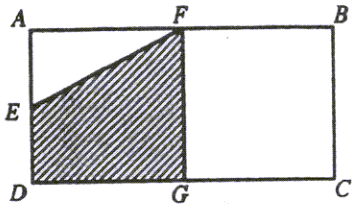
9. Mathsteal The Pirate kept for himself $\frac{5}{6}$ of the gold coins captured, and distributed the rest equally among his three crew members.
If each crew member received 25 gold coins,
how many coins did Mathsteal The Pirate keep ? _____(coins) 9

Grade Six (6) Division

10. The average of a list of six numbers is 21. If you add a seventh number with value of 28 to the list, what will be the new average of the list ? _____ 10

11. Ms Save-It always saves 30% of her monthly salary. When her monthly income increased by 25%, her monthly saving increased by $150. What is her monthly salary after the increase ? _____($) 11

12. $ABCD$ is a rectangle. E is the midpoint of AD, F is the midpoint of AB, and G is the midpoint of CD. What fraction of the area of the rectangle $ABCD$ is shaded ? Express your answer as a common fraction.



_____ 12

13. If two standard dice are tossed, what is the probability that the sum of the numbers on the ten visible faces is equal to 32 ? Express your answer as a common fraction. _____ 13

14. The length of a circular track is 500 metres and it takes James 80 seconds to run the entire length of the track. Speedy, his dog, runs 20% faster.

What is the average speed of the dog (in kilometres per hour) ? _____($\frac{km}{h}$) 14

15. Four of the following test scores are Dan's and the other four are John's:
81, 82, 83, 84, 85, 86, 87, 100.
Dan's average score is 84. What is the average score of John ? _____ 15

16. Angela tosses a fair coin four times. What is the probability that she gets at least 3 heads in a row ? Express your answer as a common fraction. _____ 16

17. The Opera House is 85% full for a performance. There are 1037 people at the performance. How many empty seats are there ? _____(seats) 17

18. What is the largest possible result when two different 2-digit integers are multiplied ? _____ 18

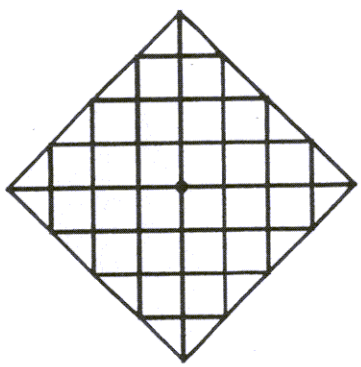
19. The teacher has 200 ribbons to give away to students who excel in math. $\frac{1}{8}$ are blue, $\frac{3}{20}$ are red, $\frac{1}{5}$ are green, and $\frac{1}{3}$ of the remainder are yellow. How many yellow ribbons does she have ? _____(yellow) 19

20. Jade wrote down all the numbers from 30 to 330.
How many times did she write the digit 1 ? _____(times) 20

21. Let $x\#y = \frac{x}{x+y}$.
If $x\#y = 9$, what is the value of $8x+9y$? _____ 21

22. There are six slips of paper in a box, with the numbers 1,2,3,4,5, and 6 written on them. Jane removed two slips from the box.
What is the probability that the decimal expansion of the product of the numbers on these two slips ends in a 0 ?
Express your answer as a common fraction. _____ 22

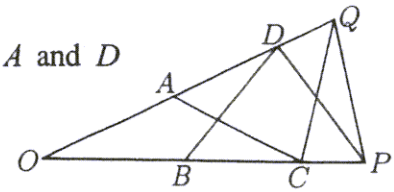
23. Each intersection point of the lines is a distance of 1 unit from its nearest neighbours horizontally and vertically.
How many ways are there of walking from the centre of the figure, along lines, to a point on the outer edge of the figure, so that the walk has a total length of 4 units ?
Hint: the symmetry of the figure should be helpful in your calculations.



_____(ways) 23

24. What is the remainder when 10^8 is divided by 97 ?
Hint: consider what happens when you divide 10^2 by 97. _____ 24

25. Points B and C lie on line segment OP, and A and D lie on line segment OQ. Given that $OA = AC = CQ = OB = BD = DP$, find the number of degrees in the measure of $\angle POQ$.
Express your answer as a common fraction.
Hint: Use the fact that some of the triangles in the figure are isosceles.



_____(°) 25

26. What is the smallest positive integer N such that $1+2+3+\ldots+(N-1)+N$ is a multiple of 100 ?
Hint: $1+2+3+\ldots+(N-1)+N = \frac{N(N+1)}{2}$. _____ 26