PIMS Elementary Grades Math Competition   NAME: _____
29 May 2004
Sprint Round - Grade Five Division   SCHOOL: _____
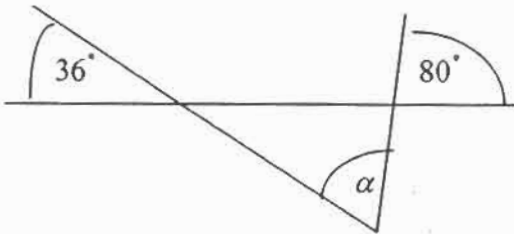
1.   Express $15 \times \frac{1}{25}$ as a common fraction.   _____ 1

2.   Find: $1 + 2 + 4 + 8 + \cdots + 256 =$ _____ 2

3.   On a straight road there are 9 bus stops. The distance between any two
      consecutive bus stops is the same. The distance between the first and the
      third stop is 600 meters. What is the distance between the first and the
      last stop (in meters) ?   _____ 3

4.   Find the angle α.

      _____ 4

5.   Find: $\frac{3}{5} \times (1 - \frac{2}{7}) + \frac{4}{7} =$ _____ 5

6.   A rectangular board is 27 cm long and 11 cm wide. We cut out of it the
      largest possible square. What is the area of that square (in cm^2) ?   _____ 6

7.   Find the value of: $(77 \times 7) + (11 \times 7) + (22 \times 7) =$ _____ 7

8.   Three workers need 15 hours to finish a job. How many hours are needed
      for five workers to finish the same job if they work at the same speed ?   _____ 8

9.   Find: $9 - 2 \times 7 + 4 \times (5 - 6) \times 7 + 11 =$ _____ 9

10.   On a planet far away, the year is 600 days long, and weeks are
      still 7 days long with the same names for each day of the week
      as on planet Earth. On one year, New Year's day was on Sunday.
      On what day of the week was the next New Year's day ?   _____ 10

11.   The base of a pyramid has 6 sides. How many vertices does
      the pyramid have ?   _____ 11

12.   What is the sum of the first 2004 terms
      of the sequence 0,1,2,0,1,2,0,1,2,... ?   _____ 12

13.   A number N has the form $323232\cdots32$ and is divisible by 9.
      What is the smallest number of digits that N can have ?   _____ 13

14. There are eleven teams in a basketball tournament. Each team must play all other teams exactly twice. How many games need to be played in this tournament ? _____ 14

15. Joe runs at a rate of 5 *meters/sec*. Jane runs at a rate of 8 *meters/sec*. If Joe and Jane have a race and Jane starts 160 meters from the finish line, how far ahead of Jane should Joe start (in meters) so they both reach the finish line at the same time ? _____ 15

16. a, b, and c, the lengths of the sides of a triangle ABC, are whole numbers. We know that $a = 7$ and that $b = 11$. What is the minimum possible value of c ? _____ 16

17. The average age of five rabbits is 28 weeks. The ages of four of the rabbits are 19, 23, 28, and 41 weeks. What is the age of fifth rabbit (in weeks) ? _____ 17

18. Calculate: $19 + 78 + 80 + 21 + 82 + 17 =$ _____ 18

19. There are 31 students in a classroom. Of these students, 16 are girls. 7 of the students have pierced ears. If 12 of the boys do not have pierced ears, how many of the girls have pierced ears ? _____ 19

20. Bob has two identical crystal pyramids, each with a square base. Bob glues the two bases together to make a new bigger crystal. How many vertices are there in the new bigger crystal ? _____ 20

21. 60% of 60% of a number is 81. What is the number ? _____ 21

22. In the country of Factoria, the only coins are 1, 2, 6, and 24 Crowns each. Mary gave Larry 71 Crowns using as few coins as possible. How many coins did she give Larry ? _____ 22

23. A pot full of water weighs 2 *kg* (the total combined weight of the pot and the water). If we spill out 20% of the water, the weight of the pot and the water together is 88% of the original weight. What is the weight of the empty pot in *kg* ? (Give your answer as a decimal expression). _____ 23

24. A farmer has only chickens and cows. If you count the legs of the chickens (two legs each) and the legs of the cows (four legs each), there are a total of 720 legs altogether. Also, there are 4 times as many cows as there are chickens. How many cows are there on the farm ? _____ 24

25. Define a new operation "&". For X, Y any two numbers, $X \& Y = \dfrac{X}{X+Y}$.

Suppose that $X \& Y = \dfrac{1}{3}$. Find the value of $Y \& X$. _____ 25