JUNIOR HIGH SCHOOL MATHEMATICS COMPETITION

May 14, 1993

GRADE 7

PART A

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1. The fraction $\frac{1}{2} + \frac{2}{3} + \frac{3}{4}$ equals:

   (A) 6/9   (B) 23/24   (C) 23/12   (D) 91/48   (E) None of these

2. Peter and Mary have a total of 1056 cookies. Peter has three times as many as Mary. How many cookies does Mary have?

   (A) 264   (B) 352   (C) 525   (D) 792   (E) None of these

3. How many integers between 1 and 101 are multiples of either 3 or 5 but not multiples of both?

   (A) 20   (B) 33   (C) 45   (D) 47   (E) 53

4. A rectangle has a width of 12 cm and a perimeter of 68 cm. What is the length of the rectangle?

   (A) 12 cm   (B) 22 cm   (C) 34 cm   (D) 56 cm   (E) None of these

5. A school bus transports a group of students. At the first stop, four students get off of the bus and seven others get on. At the second stop, Isabelle and her little sister get off. The remaining twelve students get off at the third and final stop. How many students were on the bus before the first stop?

   (A) 10   (B) 11   (C) 12   (D) 13   (E) 14

6. A newspaper vendor receives a salary of $10 per week plus 5 cents for each newspaper sold. How many papers must the vendor sell to make $25 in a week?

   (A) 100   (B) 200   (C) 210   (D) 300   (E) 350

7. When water freezes, the ice occupies a volume 9% greater than that of the water. How much water must be frozen to make 872 m^3 of ice?

(A) 800 m^3 (B) 880 m^3 (C) 950 m^3 (D) 990 m^3 (E) None of these

8. A pipe of length 250 m is cut into pieces of length 25 m each. If it takes 3 minutes to make each cut, how long would it take to cut up the complete pipe?

(A) 24 minutes   (B) 27 minutes   (C) 30 minutes   (D) 33 minutes   (E) 36 minutes

9. An astronaut who has a weight of 72 kg on the earth, has a weight of 12 kg on the moon. If another astronaut has a weight of 10.5 kg on the moon, what is the astronaut's weight on the earth?

(A) 52.5 kg   (B) 63 kg   (C) 70.5 kg   (D) 73.5 kg   (E) None of these

10. Anne is two years older than Brigitte and Brigitte is 6 years older than Carol. What is the sum of their ages when Anne is twice as old as Carol?

(A) 24   (B) 32   (C) 38   (D) 42   (E) None of these

PART B

11. Donald can pick 25% more apples than Roman in the same amount of time. If together they can pick 90 apples in an hour, how long would it take Donald to pick 120 apples?

    (A) 2 hours   (B) 2 hours & 24 minutes   (C) 2 hours & 40 minutes   (D) 3 hours
    (E) None of these

12. Twenty-eight students in a class each select 2 gloves from a box containing red and green gloves. If 20 students have gloves that are both the same colour, how many students have at least one green glove?

    (A) 8   (B) 15   (C) 20   (D) 28   (E) Not enough information

13. How many ice cubes of size 3 cm on each side does it take to build a solid rectangular box which is 60 cm long, 33 cm wide, and 30 cm high?

    (A) 550   (B) 1100   (C) 2200   (D) 3300   (E) None of these

14. What is the next term in the sequence 1, 3, 5, 11, 21, 43 ...?

    (A) 64   (B) 78   (C) 85   (D) 87   (E) 100

15. The first four customers in a store spent an average of $12 each. How much must the next 3 customers spend so that the average for all of the customers is $15?

    (A) $18   (B) $45   (C) $50   (D) $57   (E) None of these

16. Robert builds a wall made from bricks. Each layer has exactly three more bricks than the layer immediately above it. If the wall has five layers, how many bricks will the top layer have if the total number of bricks in the wall is 80?

    (A) 10   (B) 13   (C) 16   (D) 22   (E) None of these

17. Martin purchases 2 apples and 4 oranges. Michelle purchases 8 apples and two oranges. If Michelle pays twice as much as Martin, how many apples can be purchased for the price of nine oranges?

   (A) 4   (B) 5   (C) 6   (D) 7   (E) Not enough information

18. An organization has 32 members. It hopes to increase the membership by 50% each year. If this is done, how many members will the organization have in 5 years?

    (A) 112   (B) 162   (C) 200   (D) 243   (E) None of these

19. A large cake weighs 7 kg and a small cake weighs 5 kg. What is the largest integer which <u>can not</u> be the total weight of a combined group of large and small cakes?

    (A) 23   (B) 29   (C) 33   (D) 36   (E) None of these

20. Julie carries out a sequence of calculations on her calculator which shows an answer of 27.42. She realizes that on the last operation, she has multiplied by .1 instead of dividing by .1, and on the operation previous to that, she had added 2 instead of subtracting 2. What would the answer have been if she had not made these two errors?

    (A) 254.2   (B) 272.2   (C) 2702   (D) 2720   (E) Not enough information

PART C

21. What is the digit in the ones' place in the expansion of 3^{47}?

    (A) 1   (B) 3   (C) 5   (D) 7   (E) 9

22. How many different routes are there from point A to point B? The arrows indicate the direction that must be followed.
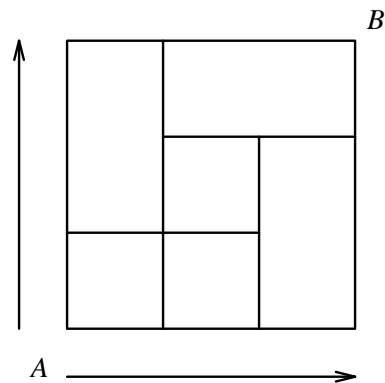
    (A) 5   (B) 7   (C) 9   (D) 10   (E) None of these

23. In the game of 6**9, a person chooses 6 different integers from 1 to 9. If the order in which the numbers are chosen is not important, how many choices are possible?

    (A) 36   (B) 54   (C) 84   (D) 504   (E) 720

24. John runs in a race against Matthew. Matthew runs twice as fast as John for the first two kilometres, but during the remainder of the race, he runs half as fast as John. If the race ends in a tie, and if John runs at a constant rate, how far do they each run?

    (A) 3 km   (B) 3.2 km   (C) 4 km   (D) 5 km   (E) Not enough information

25. Which of the following numbers can <u>not</u> be expressed as the sum of exactly 3 different numbers from the set: {3, 7, 15, 19, 28, 33}?

    (A) 38   (B) 44   (C) 55   (D) 67   (E) None of these

26. A sequence of numbers is defined as follows: The first two terms are 1 and 2. Each succeeding term is 3 times the previous term minus the term before that. What is the 5th term in the sequence.

    (A) 31   (B) 34   (C) 39   (D) 54   (E) None of these