UNIVERSITY OF NEW BRUNSWICK
and
UNIVERSITÉ DE MONCTON

JUNIOR HIGH SCHOOL MATHEMATICS COMPETITION

May 24, 1996

GRADE 7

PART A

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1. What is the value of $\dfrac{1}{2} + \dfrac{1}{3} + \dfrac{1}{2} \times \dfrac{1}{3}$?

   (A) $\dfrac{1}{12}$ (B) $\dfrac{5}{12}$ (C) $\dfrac{4}{9}$ (D) $\dfrac{2}{3}$ (E) 1

2. To send a package, a company charges \$1 plus \$0.05 per kilogram and \$0.01 per kilometer. How much would you pay to send a 9 kilogram package from Moncton to Fredericton if the distance between those cities is 180 kilometers?

   (A) \$1.45   (B) \$2.25   (C) \$3.25   (D) \$18.45   (E) None of these

3. John receives \$300 every week as a salary. If one week out of two weeks he keeps one third of it and the rest of the time he keeps one half of it, how many weeks will it take to save a total of \$1500?

   (A) 5 weeks   (B) 6 weeks   (C) 10 weeks   (D) 12 weeks   (E) 15 weeks

4. The planet Pluto has 3 moons. Moon 1 takes 6 days to make a complete revolution around the planet, moon 2 takes 10 days and moon 3 takes 15 days. Starting from the position shown on the diagram, how many days are necessary to return to the original position?
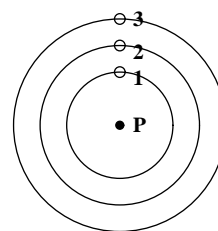
   (A) 30 days   (B) 60 days   (C) 90 days   (D) 150 days   (E) 900 days

5. What is the square root of 5508409?

   (A) 2345   (B) 2346   (C) 2347   (D) 2348   (E) 2349

6. A palindrome is a number which remains the same when its digits are reversed (for example 353, and 2002). My car odometer currently reads 31431 kilometers. What is the shortest distance that I must travel before the number showing on the odometer is a palindrome?

   (A) 18   (B) 82   (C) 100   (D) 592   (E) 992

7. On a map, two towns are 11 centimeters apart. If the scale of the map is 1 cm = 25 km, how far apart are the towns?

   (A) 44 km   (B) 50 km   (C) 225 km   (D) 275 km   (E) 2525 km

8. The capacity of a tank sprayer is 4000 liters. If 200 liters of water is mixed with 50 liters of herbicide for each acre sprayed, how many acres can be sprayed if the tank is 75% full when the spraying begins?

   (A) 12   (B) 15   (C) 16   (D) 20   (E) None of these

9. How much should we add to the product 241×376 to obtain a multiple of 9?

   (A) 2   (B) 3   (C) 4   (D) 5   (E) 6

10. An employer pays one and a half times the hourly rate for each hour worked in excess of 8 hours. If an employee works 10 hours, by what percent are the wages of an 8 hour day increased?

   (A) 25%   (B) 32.5%   (C) 37.5%   (D) 40%   (E) None of these

PART B

11. A rectangular pool is 8m wide and 12m long. A concrete walk of uniform width surrounds the pool. If the total area of the pool and the walk is 320 square meters, how many meters wide is the walk?

    (A) 2   (B) 4   (C) 6   (D) 8   (E) None of these

12. If $1' = 12''$, determine the number of $6'' \times 4'' \times 8''$ rectangular boxes that can fit completely inside a $2' \times 2' \times 2'$ box.

    (A) 8   (B) 9   (C) 54   (D) 72   (E) None of these

13. How many two digit numbers are there whose first digit is larger than the second digit?

    (A) 36   (B) 40   (C) 45   (D) 50   (E) None of these

14. Four of the following are equal. Which is the odd one out?

    (A) $\dfrac{1}{12} + \dfrac{2}{3}$ (B) $\dfrac{13}{20} + \dfrac{1}{10}$ (C) $\dfrac{5}{12} + \dfrac{1}{6}$ (D) $\dfrac{1}{4} + \dfrac{1}{2}$ (E) $\dfrac{11}{20} + \dfrac{1}{5}$

15. A mathematics contest consists of 26 questions. Seven points are awarded for each correct answer, and 3 points are deducted for each wrong answer. If a question is omitted, no points are awarded. If Daniel gets a score of 76 on the contest, how many questions did he answer correctly?

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

16. A three digit number is between 130 and 200. It is divisible by 6 and 8. The tens digit is greater than the ones digit. What is the number?

    (A) 144   (B) 168   (C) 184   (D) 192   (E) 196

17. A water tank contains 48 liters when it is half full. How much water needs to be added so that it will be $\dfrac{2}{3}$ full?

   (A) 16   (B) 18   (C) 20   (D) 22   (E) 24

18. **A** and **B** are the middle points of the sides. What fraction (of the total area) does the shaded region represent?
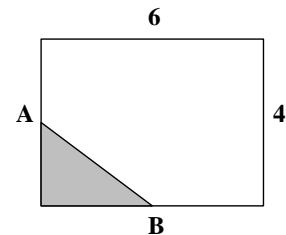
(A) $\dfrac{1}{16}$ (B) $\dfrac{1}{8}$ (C) $\dfrac{1}{4}$ (D) $\dfrac{1}{3}$ (E) None of these

19. A wall which is 9.1 meters long is divided by 10 evenly spaced 10 cm square posts (including the posts on the corners). How many cm wide is the space between consecutive posts?

(A) 81   (B) 90   (C) 91   (D) 100   (E) None of these

20. In how many ways can 7 different colours be arranged in a row if the first colour is always red, the last colour is always blue and the middle colour is always green?
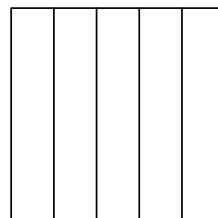
(A) 4   (B) 7   (C) 12   (D) 24   (E) 96

PART C

21. What is the area of the shaded region?
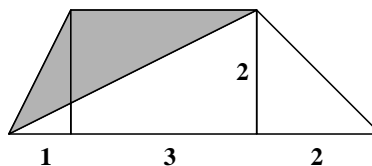
    (A) 2   (B) 3   (C) 4   (D) 5   (E) 6

22. The square is divided into 5 congruent rectangles. If the perimeter of one rectangle is 30 units, what is the perimeter of the square?

    (A) 50   (B) 60   (C) 150   (D) 225   (E) Not enough information

23. The lengths of two sides of a triangle are 5 and 13. How many integers are possible values for the length of the third side?

    (A) 1   (B) 9   (C) 10   (D) 11   (E) 12

24. How many 3-digit numbers are there for which the sum of the digits of the number is 24?

    (A) 3   (B) 6   (C) 7   (D) 10   (E) 18

25. In Canada we use coins of the following denominations: $0.01, $0.05, $0.10, $0.25, $1 and $2. In how many ways can we obtain a sum of $3.15 using exactly 10 coins?

    (A) 1   (B) 2   (C) 3   (D) 4   (E) It is not possible

26. All the positive integers less than 49 are multiplied together. How many zeros will this product end in?

    (A) 5   (B) 9   (C) 10   (D) 48   (E) 49