

UNIVERSITY OF NEW BRUNSWICK
and
UNIVERSITÉ DE MONCTON

JUNIOR HIGH SCHOOL MATHEMATICS COMPETITION

May 15, 1992

GRADE 9

PART A

1. The ratio of girls to boys in a class was 4:5. After 4 girls were added to the class, it was found that the number of boys and girls was now equal. How many students are now in the class?

(A) 34 (B) 36 (C) 38 (D) 40 (E) 42

2. Lynne is currently 100% older than her younger sister Sylvie. In 8 years, she will be only 20% older. How old is Sylvie now?

(A) 2 years (B) 4 years (C) 10 years (D) 20 years (E) None of these

3. A rectangularly-shaped room has dimensions $2.5m \times 4m \times 3m$. What is the volume of the room in cubic centimeters?

(A) 30×10^4 (B) 9.5×10^6 (C) 19×10^6 (D) 30×10^6 (E) None of these

4. At a school, there are 3 boys for every 4 girls. How many girls are at the school if there are 366 boys.

(A) 408 (B) 468 (C) 488 (D) 508 (E) 368

5. If $x^{0.2503} = 5$, what is the value of $x^{0.7509}$?

(A) 15 (B) 25 (C) 125 (D) 150 (E) None of these

6. What is the next term in the sequence $\frac{3}{4}, 1, \frac{15}{14}, \frac{21}{19}, \dots$?

(A) $\frac{10}{11}$ (B) $\frac{9}{8}$ (C) $\frac{6}{5}$ (D) $\frac{5}{4}$ (E) None of these

7. Simplify the fraction

$$\frac{1}{1 + \frac{1}{2 + \frac{1}{3}}}$$

- (A) $\frac{7}{10}$ (B) $\frac{6}{7}$ (C) $\frac{7}{6}$ (D) $\frac{10}{7}$ (E) None of these
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8. How many ways can the number 12 be expressed as a sum of exactly three distinct positive integers taken in increasing order?

(e.g. $12 = 1 + 3 + 8$)

- (A) 5 (B) 6 (C) 7 (D) 11 (E) 15
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9. While replanting a forest, 3 men planted 1500 seedlings in 4 days. If 5 men must plant 4000 seedlings, how many days will it take?

- (A) 5.2 days (B) 6 days (C) 6.4 days (D) 7 days (E) 7.6 days
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10. The perimeter of a rectangular region is 64 meters. If the length of the region is 2 meters longer than the width, how wide is the region?

- (A) 15 (B) 16 (C) 17 (D) 31 (E) None of these
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PART B

11. A wheel which is 70 cm. in diameter turns 70 times as it rolls (without slipping) along the road. To the closest metre, what distance does it move?

(A) 49 m (B) 140 m (C) 490 m (D) 1400 m (E) 154 m

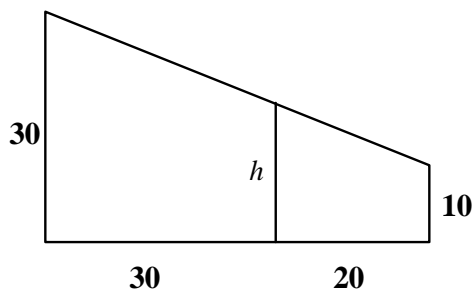
12. If $a^* = \frac{1}{a^2}$, for any positive number a , then $(2^* + 1^*)^*$ is equal to

(A) $\frac{16}{9}$ (B) $\frac{9}{16}$ (C) $\frac{16}{25}$ (D) $\frac{25}{16}$ (E) None of these

13. A theatre contains 25 rows of seats. The first row contains 25 seats. Each succeeding row has one more seat than the row immediately before it. How many seats does the theatre have?

(A) 625 (B) 876 (C) 925 (D) 950 (E) Not enough information

14. What is the value of the length h ?



(A) 15 (B) 18 (C) 20 (D) 24 (E) Not enough information

15. What is the value of $53634^2 - 53633^2$?

(A) 1 (B) 2 (C) 53634 (D) 100001 (E) 107267

16. How many rectangular pieces of wood of size 20 cm by 45 cm can be cut from a plywood sheet of 120 cm by 240 cm?

(A) 29 (B) 30 (C) 31 (D) 32 (E) 33

17. You are given the five numbers p, q, r, s, t . If the average of p and t is 7, and if the average of q, r and s is 12, what is the average of all five numbers?

(A) 5 (B) 9.5 (C) 10 (D) 19 (E) Not enough information

18. Which of the following groups of three numbers can represent the lengths of the sides of a right triangle?

- (A) 4,5,6 (B) 7,24,25 (C) 9,41,42 (D) 12,50,51 (E) 15,64,65
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19. Two persons travel in opposite directions on a circular track whose length is 1 km. Person *A* runs at 7 km per hour while person *B* walks at 2 km per hour. If they both start at the same point, how many times will they pass each other before they again meet at their original starting point?

- (A) 1 (B) 2 (C) 6 (D) 8 (E) 13
-

20. A box contains marbles, one-third of which are red, eighteen are green, and the remainder blue. After six blue marbles are added to the box, it is found that one-half of the marbles are blue. How many marbles were originally in the box?

- (A) 54 (B) 60 (C) 72 (D) 78 (E) 90
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PART B

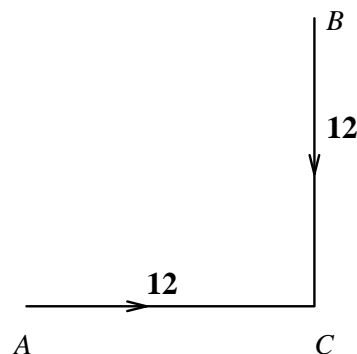
21. A store sells juice in two sizes of bottles: small and large. A large bottle costs three times as much as a small one. Jack bought 10 small bottles and 6 large bottles. With the same amount of money, Lise bought 24 bottles. How many little bottles did Lise buy?

(A) 16 (B) 18 (C) 20 (D) 22 (E) Not enough information

22. Which of the following numbers is the largest?

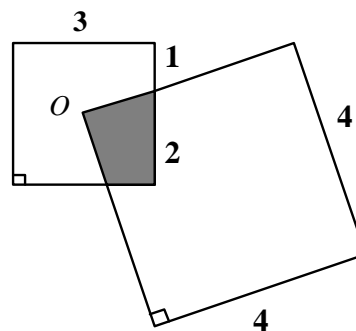
(A) $(1 + 3^{1/2})^2$ (B) $2\left(\frac{1}{6} + \frac{1}{3}\right)^{-1}$ (C) 5 (D) $(24)^{0.5}$ (E) $\left(\frac{10}{7}\right)\left(\frac{9}{6}\right)\left(\frac{8}{5}\right)$

23. A ship sails in a straight line from point A to point C at 2 km per hour while a second ship sails from B to C in a straight line at 3 km per hour. After how many minutes will they be exactly 10 km apart?



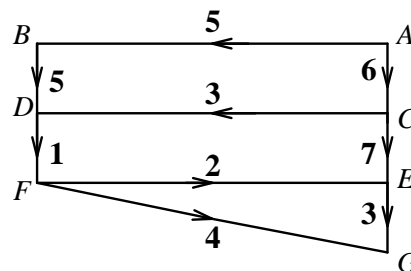
(A) 100 (B) 120 (C) 144 (D) 168 (E) 240

24. What is the area of the shaded region if O is the point of intersection of the diagonals of the smaller square?



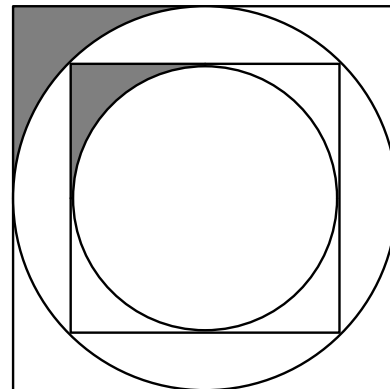
(A) $\frac{3}{2}$ (B) 2 (C) $\frac{9}{4}$ (D) 4 (E) Not enough information

25. The diagram represents a map with roads connecting some cities. Distances are indicated by the numbers given and travel is only possible in the direction of the arrows. What is the length of the shortest path from city A to city G ?



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

26. Two circles occupy the positions shown with respect to the two squares. The two circles are each inscribed in their square and the small square is inscribed in the large circle. What is the difference in the areas of the two shaded regions if the small square has sides which measure 8 cm?



- (A) $8 - 2\pi$ (B) $16 - 4\pi$ (C) $32 - 8\pi$ (D) $64 - 16\pi$ (E) None of these