

UNIVERSITY OF NEW BRUNSWICK  
and  
UNIVERSITÉ DE MONCTON

JUNIOR HIGH SCHOOL MATHEMATICS COMPETITION

May 12, 1995

**GRADE 9**

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**PART A**

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1. What is the value of  $\frac{4}{5} + \frac{3}{2} \times \frac{4}{5}$ ?

- (A)  $\frac{24}{25}$       (B)  $\frac{3}{2}$       (C)  $\frac{8}{5}$       (D)  $\frac{46}{25}$       (E) 2
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2. A ski shop offered a 25% discount on a pair of skis that originally sold for \$90.00. The new price was then reduced by 10%. The final price was:

- (A) \$31.50      (B) \$55.00      (C) \$58.50      (D) \$60.75      (E) \$81.00
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3. What is the sum of a third of 10 and a half of a third of 20?

- (A) 5      (B)  $\frac{20}{3}$       (C) 10      (D)  $\frac{40}{3}$       (E) None of these
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4. Two men play a card game for which the stakes are \$0.10 a game. At the end, one has won 3 games and the other has won \$0.30. How many games did they play?

- (A) 6      (B) 7      (C) 8      (D) 9      (E) Not enough information
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5. Adam lived a quarter of his life as a boy, a fifth as a young man, a third in middle-age and 13 years in retirement. How old was he when he died?

- (A) 42      (B) 56      (C) 60      (D) 120      (E) None of these
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6. Starting at 777 and counting backwards by 7s, a student counts 777, 770, 763, etc. A number that will be counted is:

- (A) 41      (B) 42      (C) 43      (D) 44      (E) 45
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7. One hundred marbles are placed in three bowls. The first and second bowl contain a total of 56 marbles, and the second and third bowl a total of 70 marbles. How many marbles are in the third bowl?

(A) 24            (B) 30            (C) 36            (D) 44            (E) Not enough information

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8. Calculate:

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

(A)  $-\frac{1}{2}$             (B)  $-\frac{3}{5}$             (C)  $\frac{1}{2}$             (D)  $\frac{3}{8}$             (E)  $\frac{5}{8}$

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9. Five apples and three bananas cost \$2.47. If the price of apples and bananas was exchanged, the same amount of fruit would cost \$3.13. How much would six apples and six bananas cost?

(A) \$4.20            (B) \$4.24            (C) \$4.40            (D) \$4.80            (E) None of these

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10. At a banquet, every 2 guests shared one dish for rice, every 3 guests shared one dish for soup and every 4 guests shared one dish for meat. How many guests were present if there were 65 dishes altogether?

(A) 42            (B) 56            (C) 60            (D) 120            (E) None of these

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**PART B**

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11. Define  $a*b$  to be the larger of  $2a$  and  $a + b$ . Then  $(2*3)*(3*2)$  is equal to

- (A) 9            (B) 10            (C) 11            (D) 12            (E) None of these
- 

12. In a group of men and women, the average age is 31. If the men's ages average 35 years, and the women's ages average 25, then the ratio of the number of men to the number of women is:

- (A) 5:7            (B) 7:5            (C) 2:1            (D) 4:3            (E) 3:2
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13. All birds fly.

Some birds are cardinals.

All robins sing.

Some cardinals sing.

All cardinals and robins are birds.

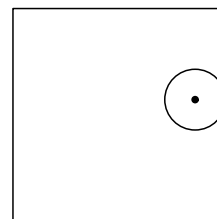
Assuming these statements are true, which of the following must be true?

- (A) All flying birds are robins.  
(B) All flying cardinals sing.  
(C) Some cardinals do not sing.  
(D) Birds that do not sing are not robins.  
(E) All cardinals do not fly.
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14. The women in a club outnumber the men by 16. 7 times the number of women exceeds 9 times the number of men by 32. Find the number of men.

- (A) 4            (B) 24            (C) 32            (D) 42            (E) None of these
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15. A circle of radius 2 rolls completely around the inside perimeter of a square of side 10. What distance is covered by the centre of the circle?



- (A) 16            (B) 24            (C) 32            (D) 40            (E) None of these
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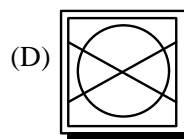
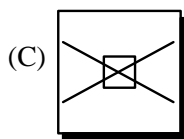
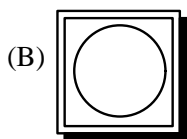
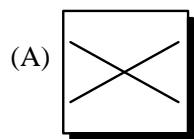
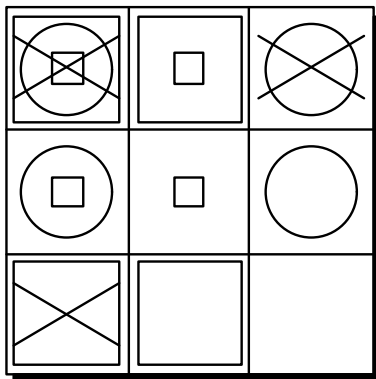
16. A sequence of numbers is obtained by multiplying each previous value by 2 and adding a number  $a$  to the result. If the 6th number is 70 and the 9th number is 609, what is the value of  $a$ ?

- (A) 1            (B) 3            (C) 7            (D) 49            (E) None of these
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17. Of the following numbers, which cannot be expressed in the form  $11A + 19B$  where  $A$  and  $B$  are positive integers?

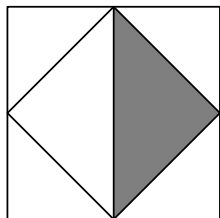
(A) 30      (B) 68      (C) 123      (D) 211      (E) None of these

18. Which of the squares (A), (B), (C) or (D) should logically occupy the missing place in the figure?



(E) Not enough information

19. The midpoints of the sides of a square are joined together and part of the resulting square is shaded. The shaded area represents what proportion of the original square?



(A)  $\frac{1}{8}$       (B)  $\frac{1}{6}$       (C)  $\frac{1}{4}$       (D)  $\frac{1}{3}$       (E)  $\frac{1}{2}$

20. Assume that a ball dropped from any height rises half the distance on the rebound. If a ball is dropped from 100 m, what distance will the ball have covered by the time it hits the ground the 4th time?

(A) 137.5m      (B) 187.5m      (C) 275m      (D) 375m      (E) Not enough information

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**PART C**

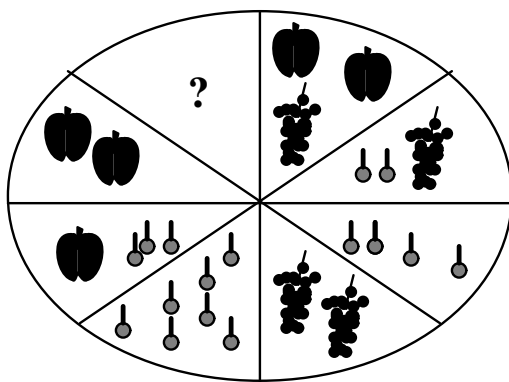

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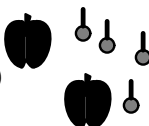
21. If the sum of the first 100 integers:  $1 + 2 + 3 + \dots + 99 + 100 = 5050$ , then the sum of the first 50 odd integers:  $1 + 3 + 5 + \dots + 99 = ?$

(A) 2500      (B) 2524      (C) 2525      (D) 2550      (E) None of these

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22. Apples, cherries, and grapes are arranged on a platter in the following fashion: opposite sectors contain fruit which is of equal value. To equal the value of two bunches of grapes, how much fruit must be placed in the empty sector?

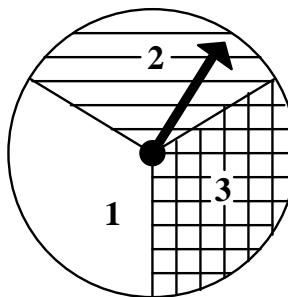
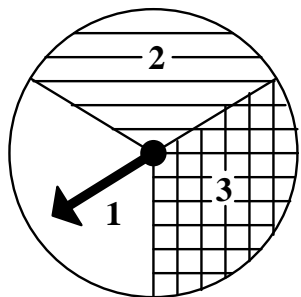


(A)       (B)       (C)       (D) 

(E) Not enough information

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23. The arrows of each of the wheels shown below are randomly spun. The chance of obtaining a total on the two wheels less than 5 is:



(A)  $\frac{1}{3}$       (B)  $\frac{3}{5}$       (C)  $\frac{5}{9}$       (D)  $\frac{2}{3}$       (E) Not enough information

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24. How many 3 letter “words” can be made using the consonants B C D, and the vowels A and E? A “word” is defined to be any sequence of 3 letters containing two consonants and one vowel in any order (allowing letters to be repeated). For example, ABC and CCE are both “words”.

(A) 18            (B) 27            (C) 54            (D) 72            (E) None of these

25. A rectangular grid is coloured with the two colours Red and Green so that each colour occurs twice in each column and twice in each row. What colours must the squares labelled *A* and *B* be coloured?

R			G
		G	
	R		B
	A		R

(A) A=R      (B) A=R      (C) A=G      (D) A=G      (E) Not enough  
       B=R            B=G            B=R            B=G            information

26. The digits from 1 to 4 are ordered in all possible ways (without repeating the same digit twice) to make 4-digit integers. These are then arranged in increasing numerical order and the list is divided into two equal halves. The last number in the first half is

(A) 2314            (B) 2134            (C) 2431            (D) 4123            (E) None of these