

2022 Junior Mathematical Olympiad

Qualifying Round Examination (Grades 4,5 and 6)

NAME_____

GRADE_____

SCHOOL_____

STUDENT CONTACT NUMBER_____

- EACH entry MUST be accompanied by a nominal entry fee of **J\$500**
- Be sure to staple ALL pages (including this one) together
- All entries must reach the Mathematics Department, U.W.I by **Wednesday 14 December**
- You may deliver by (a) Hand (b) Courier (c) Local Mail

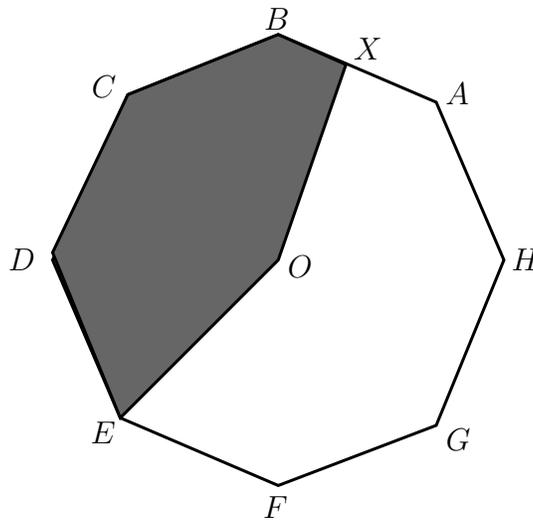
- The Courier address is
Mathematics Department, UWI
Mona
Kingston 7

- The Mailing address is
Junior Mathematical Olympiad
P.O. Box 94
Mona Post Office
Kingston 7

For each question, determine the letter corresponding to the correct or best response; along with the question number, indicate this letter by circling or shading it

1. The product of two different whole numbers is 7. What is the sum of the two whole numbers?
(A) 7 (B) 8 (C) 6 (D) 9 (E) 14
2. If marbles cost \$48 per dozen (twelve), how many marbles can be bought with \$140?
(A) 25 (B) 26 (C) 28 (D) 30 (E) 35
3. Steven plants 10 trees every 3 minutes. Planting trees at the same rate, how long would it take him to plant 2500 trees?
(A) $1\frac{1}{4}$ hour (B) 3 hours (C) 5 hours (D) 10 hours (E) $12\frac{1}{2}$ hours
4. Anna, Buella and Cayla bought candies. Anna bought three times as many as Buella and Cayla bought twice as many as Anna. If Cayla bought 18 candies, how many candies did Buella buy?
(A) 12 (B) 1 (C) 3 (D) 6 (E) 9
5. In its first four games, a netball team scores an average of 31 points per game. After the fifth game, the average for the first five games is 30. How many points did the team score in the fifth game?
(A) 25 (B) 26 (C) 27 (D) 28 (E) 29
6. The sum of two prime numbers is 85. What is the product of these two prime numbers?
(A) 85 (B) 91 (C) 115 (D) 133 (E) 166
7. Mark's car can travel 22 km per litre of gas. Gas costs \$200 per litre. How many kilometres can Mark travel on \$1000 worth of gas?
(A) 44 (B) 66 (C) 110 (D) 132 (E) 220
8. Six rectangles each have base of widths 2 and lengths 1, 4, 9, 16, 25 and 36. What is the sum of the areas of the six rectangles?
(A) 91 (B) 93 (C) 162 (D) 182 (E) 202

9. **BLANK** is the mother of the daughter of the mother of Mia's daughter?
BLANK is
 (A) Mia's sister (B) Mia (herself) (C) Mia's mother (D) Mia's niece (E) Mia's aunt
10. On a sheet of paper, the number 5021972970 is written. With a pair of scissors, Charlie cuts the paper twice to get three numbers.
 When Charlie add these three number, what is the smallest sum can he get?
 (A) 3244 (B) 3444 (C) 5172 (D) 5217 (E) 3669
11. a and b are integers satisfying $200 \leq a \leq 400$ and $600 \leq b \leq 1200$. What is the largest value of the quotient $\frac{b}{a}$?
 (A) $\frac{3}{2}$ (B) 3 (C) 6 (D) 300 (E) 600
12. The point O is the centre of a regular octagon $ABCDEFGH$. The point X is the mid-point of the side AB .



What fraction of the octagon is shaded?

- (A) $\frac{11}{32}$ (B) $\frac{3}{8}$ (C) $\frac{13}{32}$ (D) $\frac{7}{16}$ (E) $\frac{15}{32}$

13. Three persons were asked how many cars and how many houses their boss had. Each of the three persons told the truth to one question but told a lie to the other. The responses are:

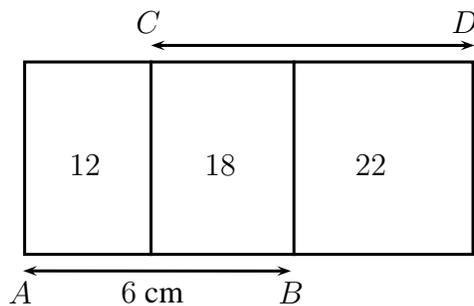
Person 1 : 8 cars and 6 houses

Person 2 : 7 cars and 4 houses

Person 3 : 7 cars and 7 houses

The number of cars plus the number of houses their boss has is

- (A) 11 (B) 12 (C) 13 (D) 14 (E) 15
14. There were 20 red marbles and 20 blue marbles in a box. Amber randomly took 20 marbles from the box and Bruce took the rest. The number of red marbles Amber got is x and the number of blue marbles she got is y . The number of red marbles Bruce got is a and the number of blue marbles he got is b .
- Which of the following statements is **always** true?
- (A) $y \geq 1$ (B) $x = y$ (C) $y = b$ (D) $y = a$ (E) $x = a$
15. Three rectangles of the same height are shown. The numbers in the rectangles represent their areas in cm^2 .



If $AB = 6$ cm, what is the length of CD ?

- (A) 7 cm (B) 7.5 cm (C) 8 cm (D) 8.2 cm (E) 8.5 cm
16. The recipe for making 100 pancakes is 25 eggs, 4 litres milk, 5 kg flour and 1 kg butter. Suzzie has 6 eggs, 400g flour, 0.5 litres of milk and 200g butter. What is the largest number of pancakes she can make using the recipe?
- (A) 6 (B) 8 (C) 10 (D) 12 (E) 15

17. On day one, Mary decided to solve 3 Math problems per day. On day nine, Danny started solving five Math problems per day, until the two of them are tied in the total number of problems solved. How many problems did each person solve when they tied?
- (A) 12 (B) 20 (C) 60 (D) 80 (E) 120

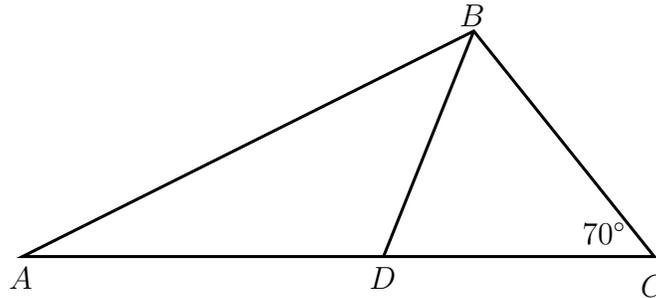
18. A, B, C, D are representing digits (not necessarily different digits). If

$$AB + CD = 137,$$

what is the value of $ADCB + CBAD$?

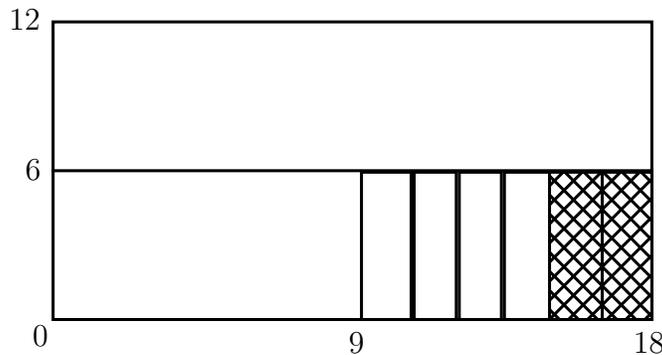
- (A) 13,737 (B) 13,837 (C) 14,747 (D) 23,737 (E) 137,137
19. When a jar is one-fifth filled with water it weighs 560 g. When the same jar is four-fifths filled with water it weighs 740 g.
- What is the weight of the empty jar?
- (A) 60 g (B) 112 g (C) 180 g (D) 300 g (E) 500 g
20. Barry is 5cm taller than Andy, but 10cm shorter than Carl. Dave is 10cm taller than Carl, but 5cm shorter than Evan. Which of the following statements is true?
- (A) Andy and Evan are equal heights
(B) Andy is 10cm taller than Evan
(C) Andy is 10cm shorter than Evan
(D) Andy is 30cm taller than Evan
(E) Andy is 30cm shorter than Evan
21. Judie had 2022 \$1 bills and exchanged all of them for \$5 bills with her brother Karl and she had some number of \$1 bills left over. She then exchanged all of her \$5 bills for \$10 bills with her sister Michailia. She then changed all of her \$10 bills for \$50 bills with her aunt Elise and she had some number of \$10 bills left over. She then changed all of her \$50 bills for \$100 bills with her mother. How much change did Judie have left over?
- (A) \$22 (B) \$27 (C) \$52 (D) \$57 (E) \$62

22. In $\triangle ABC$ the point D is on AC and is such that $BD = DC$ and $\angle BCD$ measures 70° .



What is the degree measure of $\angle ADB$?

- (A) 100 (B) 120 (C) 135 (D) 140 (E) 150
- 23.



What fraction of the large (12 by 18) rectangle is shaded?

- (A) $\frac{1}{108}$ (B) $\frac{1}{18}$ (C) $\frac{1}{12}$ (D) $\frac{2}{9}$ (E) $\frac{1}{3}$
24. How many integers between 1000 and 9999 have different digits (all four)?
- (A) 3024 (B) 4536 (C) 5040 (D) 6480 (E) 6561
25. On day 1, Maria signed 1 contract, on day 2, she signed 3 contracts, on day 3, she signed 5 contracts. On succeeding days she signed 2 more contracts than the amount she signed the previous day. After day 20, what is the total number of contracts signed by Maria?
- (A) 400 (B) 401 (C) 210 (D) 39 (E) 40

Please write your name here_____