

# 2024-2025 Junior Mathematical Olympiad

## Qualifying Round Examination (Grades 5 and 6)

NAME\_\_\_\_\_

GRADE\_\_\_\_\_

SCHOOL\_\_\_\_\_

STUDENT CONTACT NUMBER\_\_\_\_\_

- EACH entry MUST be accompanied by a nominal entry fee of **J\$1000**
- All entries must reach the Mathematics Department, U.W.I by  
**Friday December 13, 2024**
- 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. Which of the following is largest in value?

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

2. What is the value when 12 million is added to 12 thousand?

(A) 12,012,000    (B) 12,120,000    (C) 120,120,000    (D) 12,000,012,000  
(E) 12,012,000,000

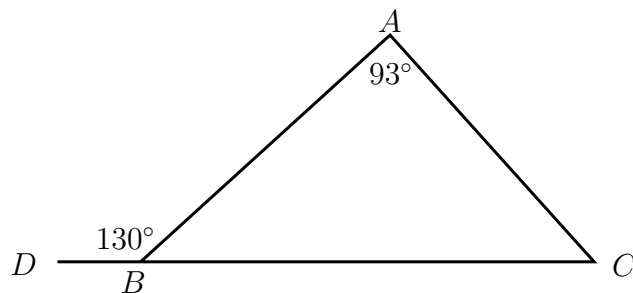
3. Petra's mother bought an equally sliced 12-slice pizza for dinner. Petra ate one slice and shared another slice equally with her brother Peter. What fraction of the pizza did Petra eat?

(A)  $\frac{1}{24}$     (B)  $\frac{1}{12}$     (C)  $\frac{1}{8}$     (D)  $\frac{1}{6}$     (E)  $\frac{1}{4}$

4. How many whole numbers between 1 and 60 contain the digit 3 at least once?

(A) 13    (B) 14    (C) 15    (D) 16    (E) 17

5. In the diagram below, what is the size of  $\angle ACB$ ?



(A)  $57^\circ$     (B)  $37^\circ$     (C)  $47^\circ$     (D)  $60^\circ$     (E)  $17^\circ$

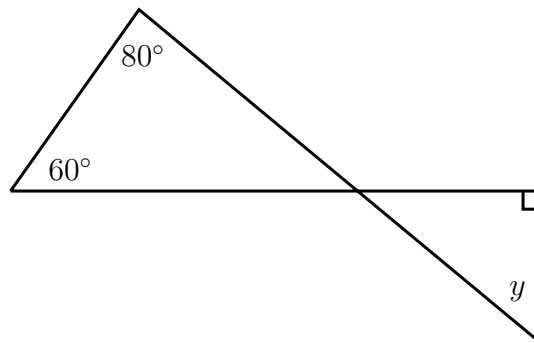
6. Sydoni bought a bag of oranges from a vendor. She gave half of the oranges to her friend Amanda and gave 3 of the oranges to her mother. She kept the remaining 4 oranges for herself. How many oranges were in the bag that Sydoni bought?

(A) 7    (B) 11    (C) 14    (D) 21    (E) 28

7.  $\ell$  is the units digit of the 5-digit number  $2024\ell$  which is divisible by 9. What is the remainder when the number  $2024\ell$  is divided by 8?

**NOTE:** If a number is divisible by 9 then the sum of the digits is divisible by 9.

- (A) 1    (B) 3    (C) 5    (D) 6    (E) 7
8. A museum has a collection of scaled models. Each real-life object is scaled down in the ratio  $1 : 20$ . A real-life building of height 289 units is scaled down and is displayed in the museum. To the nearest whole number, what is the height, in units, of its displayed replica?
- (A) 14    (B) 15    (C) 16    (D) 18    (E) 20
9. Martha travelled to the beach. She travelled 80 kilometres on the highway and 20 kilometres on the beach access road. She drove three times as fast on the highway as she did on the beach access road. If Martha spent 30 minutes driving on the beach access road, how many minutes did her entire trip take?
- (A) 50    (B) 70    (C) 80    (D) 90    (E) 100
10. In weights, you are told that  $\blacksquare, \blacksquare, \blacksquare, \blacksquare$  balance  $\spadesuit, \spadesuit$  and that  $\spadesuit, \spadesuit, \spadesuit$  balance  $\star, \star$ . Which of the following would NOT balance  $\star, \spadesuit, \blacksquare$ ?
- (A)  $\blacksquare, \spadesuit, \star$     (B)  $\blacksquare, \blacksquare, \blacksquare, \star$     (C)  $\blacksquare, \blacksquare, \spadesuit, \spadesuit$     (D)  $\star, \star, \blacksquare, \blacksquare$   
 (E)  $\spadesuit, \blacksquare, \blacksquare, \blacksquare, \blacksquare$
11. In the diagram below,

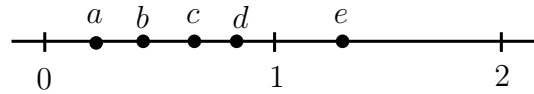


what is the value of  $y$ ?

- (A)  $40^\circ$     (B)  $60^\circ$     (C)  $45^\circ$     (D)  $50^\circ$     (E)  $80^\circ$

12. Ann, who owes Andrea \$3700, is ready to pay her. Ann has a large number of \$50 notes, \$100 notes and \$500 notes which she plans to use to pay Andrea. If  $S$  is the smallest number of notes she can use to pay and  $L$  is the largest number of notes that she can use to pay, what is the value of  $L - S$ ?
- (A) 60      (B) 61      (C) 63      (D) 65      (E) 67
13. All the money I have are in \$50 notes, \$100 notes and \$500 notes. I have an equal number of each note and the total amount of money that I have is \$7,150. What is the total value of my \$50 notes?
- (A) \$350      (B) \$400      (C) \$450      (D) \$500      (E) \$550
14. Henry's birthday is today. Henry is good at mathematics and told his friend:
- "My age in months is 99 greater than my age in years."
- In years, how old is Henry today?
- (A) 8      (B) 9      (C) 11      (D) 12      (E) 14
15. Reidie is an avid reader. Reidie completely reads a book in one week (7 days). Reidie reads an average of 63 pages per day for the first three days and an average of 84 pages per day for the next three days. He then finished the book by reading the remaining 9 pages on the seventh day. How many pages does the book contain?
- (A) 440      (B) 450      (C) 460      (D) 470      (E) 480
16. Kaye keeps a total of 90 fish in 4 fish tanks. There is 1 more fish in Tank 2 than is in Tank 1. There is 2 more fish in Tank 3 than is in Tank 2 and there is 3 more fish in Tank 4 than is in Tank 3. How many fish are in Tank 4?
- (A) 20      (B) 21      (C) 23      (D) 24      (E) 26
17. There are 351 employees at Company Corp. Each of these employees owns a car, a motorcycle, or both. You are also given that 331 employees own cars and 45 employees own motorcycles. How many of these car owners **do not** own a motorcycle?
- (A) 20      (B) 25      (C) 30      (D) 45      (E) 306

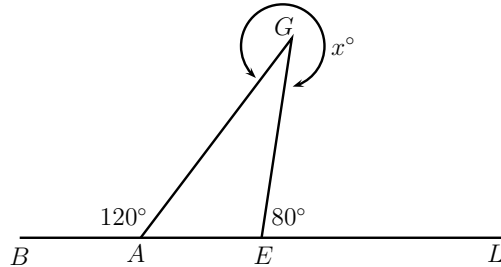
18. Five numbers  $a, b, c, d$  and  $e$  are such that  $a < b < c < d < e$  where  $a, b, c$  and  $d$  are between 0 and 1 and  $e$  is between 1 and 2.



The number line above shows the relative positions of  $a, b, c, d$  and  $e$ . Which of the following best represents the value of the product  $b \times c$ ?

- (A)  $a$     (B)  $b$     (C)  $c$     (D)  $d$     (E)  $e$
19. Tyler the tiler is tiling a rectangular floor that has dimensions 12 units by 16 units. His plan is to use one-unit by one-unit square tiles to form a border along the edges of the floor and to tile the rest of the floor using two-units by two-units square tiles. According to Tyler's plan, how many tiles will he use?
- (A) 48    (B) 87    (C) 91    (D) 96    (E) 120
20. As a herd of goats pass her house, Barbara counts them. The goats begin to pass her house at 3:00 p.m. and pass at a constant rate of 3 goats per minute. After counting 42 goats, Barbara falls asleep. She wakes up an hour and a half later, at this point, exactly half of the total in the herd has passed her house since 3:00 p.m. How many goats are there in the entire herd?
- (A) 630    (B) 621    (C) 582    (D) 624    (E) 618
21. Of the following, which could represent the sum of 5 consecutive even integers?
- (A) 620    (B) 621    (C) 622    (D) 623    (E) 624

22. The points  $B, A, E$  and  $L$  all lie on a straight line. The point  $G$  is off the line and is such that  $\angle BAG = 120^\circ$  and  $\angle GEL = 80^\circ$ .



The **reflex angle** at  $G$  is  $x^\circ$ . What is the value of  $x$ ?

- (A) 340    (B) 200    (C) 300    (D) 240    (E) 310
23. A primary school soccer league consists of  $n$  different teams. In last year's league competition, each team played every other team **exactly once**. A total of 21 league games were played last year. What is the value of  $n$  (the number of teams)?
- (A) 6    (B) 7    (C) 8    (D) 9    (E) 10
24. The clock in Eva's car is not accurate and *gains time* at a constant rate. On Monday, at 12:00 noon, Eva's watch, which always shows the correct time, is showing 12:00 noon and the clock in Eva's car is also showing 12:00 noon. Thirty 30 minutes later, her watch is showing 12:30 and her car clock is showing 12:35. Later that day, Eva loses her watch and observes that her car clock is showing 7:00. What is the actual time when her car clock is showing 7:00?
- (A) 5:50    (B) 6:00    (C) 6:30    (D) 6:55    (E) 8:10
25. Sample One of an ore weighs 1200 kg and contains 3% gold. Sample Two of another ore weighs 2400 kg and contains 6% gold. Both samples are combined to form a mix of weight 3600 kg. Of this mix, a sample that weighs 100 kg contains 40% gold. What is the percentage of gold in the remaining 3500 kg of the mix?
- (A) 1%    (B) 2%    (C) 3%    (D) 4%    (E) 5%

Please write your name here \_\_\_\_\_