

UWI-IAJ Vivian Rochester Junior Mathematical Olympiad

Notice. The Junior Olympiad Examination published in the Gleaner's Children's Own on February 7, 2011, was not the examination intended. The published paper is in fact a draft version which was later revised. However, the Department of Mathematics inadvertently sent the earlier version to the Gleaner for publication instead of the revised one as intended. This has caused some confusion and we apologize for the error.

Once the error was discovered, the Junior Olympiad Organizing Committee decided to use the question paper published on February 7 as a practice examination. Solutions for this paper are now posted on the website of the Department of Mathematics. Students, teachers, and parents are invited to download these solutions for their own perusal.

In addition, the Department of Mathematics has set a new paper. This is the new and official Qualifying Examination and will appear on February 14, 2011. It is open to all students in Grades 4, 5, and 6 in a Primary, All-Age, Preparatory, or other recognized school in Jamaica. We invite all eligible students to take this test and join the 2011 Junior Mathematical Olympiad. All submissions should reach the Department of Mathematics by February 28, 2011.

We continue to look forward to having students throughout Jamaica in Grades 4, 5, and 6 participate in this exciting event. The Junior Olympiad will generate greater interest in mathematics and serve as the foundation for the future success of all participating students.

Questions for Practice Examination of February 7

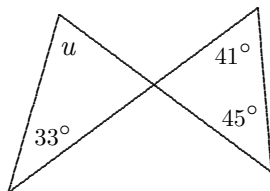
- 1) Juan ate one sweetie last Easter Monday, Every day after that he ate one sweetie more than he did the day before. How many sweeties did Juan eat by Wednesday of the following week? (Include the sweeties he ate on that Wednesday.)

(a) 55 (b) 45 (c) 10 (d) 9 (e) 27

- 2) How many numbers between 1 and 100 contain the digit 2 exactly once?

(a) 18 (b) 17 (c) 10 (d) 90 (e) 19

- 3) In the figure below, some of the angles have the values shown. What is u ?

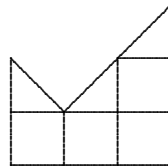


(a) 53° (b) 61° (c) 90° (d) 45° (e) 47°

4) In the sequence below, what will the 2011th symbol be?

$< \wedge > \vee < \wedge > \vee < \wedge > \vee \dots$

- (a) $>$
 - (b) \wedge
 - (c) $<$
 - (d) \vee
 - (e) none of the above
- 5) Luis has three boxes: one white, one red, and one green. One of the boxes contains a chocolate, one has a sweetie, and one is empty. The sweetie is not in the white box and not in the green box. The chocolate must be either in the white or the red box. Which box is empty?
- (a) the green box
 - (b) the red box
 - (c) the white box
 - (d) the white or the red box
 - (e) not enough information is given
- 6) The figure below is made from four small squares and three equal triangles. If each small square has area 10, what is the area of the figure?

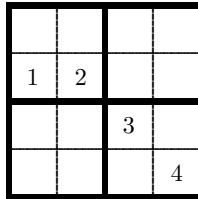


- (a) 55
 - (b) 50
 - (c) 45
 - (d) 60
 - (e) 65
- 7) How many numbers between 100 and 1000 are divisible by both 3 and 4?
- (a) 75
 - (b) 12
 - (c) 300
 - (d) 526
 - (e) 74
- 8) A box with 30 marbles weighs 650 g. When 10 marbles are added its weight becomes 800 g. How much does the box weigh empty?
- (a) 200 g
 - (b) 300 g
 - (c) 350 g
 - (d) 650 g
 - (e) 150 g
- 9) Juan is 33 years old. He has two sons aged 10 and 11. In how many years will the sum of his sons' ages equal Juan's age?
- (a) 12
 - (b) 21
 - (c) 33
 - (d) 6
 - (e) 10

10) Marsha wrote down the numbers 1, 2, 3, ..., and stopped after she wrote 1,000. How many digits did she write down in all?

- (a) 2893 (b) 1000 (c) 999 (d) 2889 (e) 2904

11) In the figure below each row, column, and 2×2 square must contain 1, 2, 3, and 4. In how many ways can this figure be completed?



- (a) 2 (b) 1 (c) 4 (d) 8 (e) 6

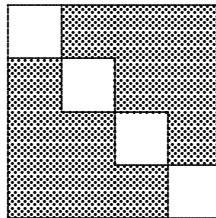
12) The combination for a certain lock is a three-digit number with no two digits the same. How many combinations are possible if the digits are 1, 3, 5, and 7?

- (a) 24 (b) 12 (c) 64 (d) 4 (e) 6

13) A cube of wood is painted blue on the outside. After the paint dries, the cube is cut into 27 smaller cubes. How many of the smaller cubes have exactly two sides painted blue?

- (a) 12 (b) 8 (c) 20 (d) 27 (e) 6

14) The figure below consists of a large outer square with four equal squares removed. If the outer square has perimeter 32, what is the shaded area?



- (a) 48 (b) 32 (c) 24 (d) 64 (e) 8

15) In six seconds a rabbit will make 4 jumps. How many seconds will it take the rabbit to make 10 jumps?

- (a) 15 (b) 12 (c) 5 (d) 14 (e) 24

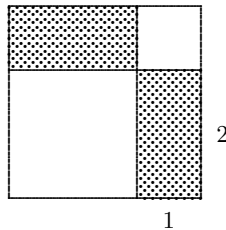
16) Three friends live on the same street: a doctor, an engineer, and a mathematician. Their names are Arnoldo (A), Bernardo (B), and Cernaldo (C). The doctor is an only child and the youngest of the three friends. Cernaldo is older than the engineer and is married to the sister of Arnoldo. The names of the doctor, the engineer, and the mathematician are, in order:

- (a) B, A, C (b) A, C, B (c) A, B, C (d) B, C, A (e) C, A, B

17) We call a three-digit number a *quaddie* if the sum of its digits is 4. How many three-digit numbers are *quaddies*?

- (a) 10 (b) 90 (c) 15 (d) 9 (e) 24

18) In the figure below, the white regions are squares and the shaded regions are rectangles. What proportion of the outer square (including all four regions) is shaded?



- (a) $\frac{4}{9}$ (b) $\frac{1}{2}$ (c) $\frac{2}{9}$ (d) $\frac{5}{9}$ (e) $\frac{4}{7}$

19) In a library there are 6 tables with 4 chairs each, 4 tables with 2 chairs each, and 3 tables with 6 chairs each. How many chairs are in the library?

- (a) 50 (b) 60 (c) 10 (d) 36 (e) 25

20) A box of red, blue, and green pencils contains 20 pencils in all. There are 6 times as many blue pencils as green ones, and fewer red pencils than blue ones. How many red pencils are in the box?

- (a) 6 (b) 13 (c) 2 (d) 7 (e) 4

End of Questions