

The 2015 Jamaican Mathematical Olympiad

Practice Problem Set 6

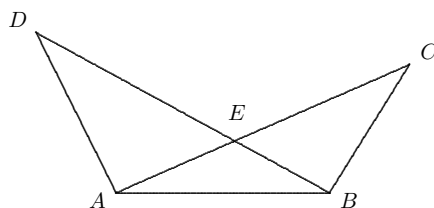
- 1) What is $\sqrt{\frac{1}{9} + \frac{1}{16}}$ in simplified form?
- 2) Marsha has between 50 and 100 books. She told her friend that 25% of her books are novels and $\frac{1}{9}$ of them are cookbooks. Exactly how many books does Marsha have?
- 3) In the figure below, $AC = 10$, $BD = 15$, and $AD = 22$. What is the length of BC ?



- 4) The height of a certain rectangle is 12 cm and its width is three times its height. What is the area of a square whose perimeter is $\frac{1}{3}$ the perimeter of the rectangle?
- 5) Maurice started with a number, divided it by 7, added 7 to the result, and multiplied the sum by 7. He ended up with 777. What number did Maurice start with?
- 6) Peter and Paul went to a scout camp. During a meeting all the scouts stood in a single row. Peter was exactly in the middle. There were 27 scouts to Paul's left and 13 to Paul's right. How many scouts stood between Peter and Paul?
- 7) A small boy started placing toothpicks on a table to form a rectangular grid, as shown in the figure below. To make a grid which is 10 toothpicks wide and 8 toothpicks tall, how many toothpicks will he need?

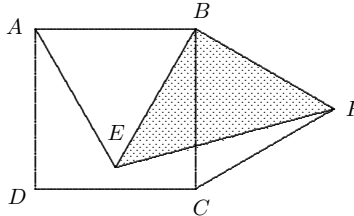


- 8) In the figure below, the area of triangle ADB is 15, the area of triangle ACB is 12, and the area of triangle ABE is 4. What is the area of the pentagon $ABCED$?



- 9) We say that a 3-digit number is *peculiar* to mean that all of its digits are odd and different from each other. How many peculiar numbers are multiples of 3?

- 10) When an integer $n > 1$ is divided by 2, 3, 4, 5, and 6, the remainder is 1 each time. What is the smallest number that n could be?
- 11) When 1000^{2012} is written as a numeral, how many digits does it have?
- 12) In the figure below, $ABCD$ is a square and ABE and BFC are equilateral triangles. If the square has side-length 3, what is the area of the shaded region?



- 13) Which power of 9^6 is equal to 27^8 ?
- 14) Suppose a , b , and c are positive real numbers such that $ab = 2\sqrt{3}$, $ac = \sqrt{6}$, and $bc = 3\sqrt{2}$. What is abc ?
- 15) Paul removed one number from a sequence of seven consecutive natural numbers. The sum of the remaining numbers is 2012. Which number did Paul remove?
- 16) A pyramid is shown in the figure below. Its base is a square with side length 1 and its sides are equilateral triangles. What is the height of the pyramid?

