

FMA Team Mathematics Competition - Zone
YEAR 11 – 2015

Y11/1 If $a = \frac{1}{2}$ and $b = \frac{2}{3}$, then $\frac{6a+18b}{12a+6b}$ equals?

Y11/2 If $2n + 5 = 16$, then what is the value of $2n - 3$?

Y11/3 In a factory, Erika assembles 3 calculators in the same amount of time that Nick assembles 2 calculators. Also, Nick assembles 1 calculator in the same amount of time that Sam assembles 3 calculators. How many calculators in total can be assembled by Nick, Erika and Sam in the same amount of time as Erika assembles 9 calculators?

Y11/4 At the post office, Sonita bought some 2¢ stamps and she bought ten times as many 1¢ stamps as 2¢ stamps. She also bought some 5¢ stamps. She did not buy any other stamps. The total value of the stamps that she bought was 100¢. How many stamps did Sonita buy in total?

Y11/5 The operation \otimes is defined by $a \otimes b = \frac{a}{b} + \frac{b}{a}$. What is the value of $4 \otimes 8$?

Y11/6 The points $(-1, q)$ and $(-3, r)$ are on a line parallel to $y = \frac{3}{2}x + 1$. What is the value of $r - q$?

Y11/7 The point $(0, 0)$ is reflected in the vertical line $x = 1$. When its image is then reflected in the line $y = 2$, what is the resulting point.

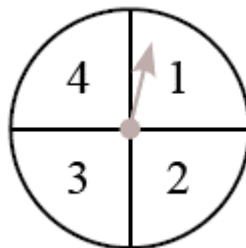
Y11/8 On an island there are two types of inhabitants: Heroes who always tell the truth and Villains who always lie. Four inhabitants are seated around a table. When each is asked "Are you a Hero or a Villain?", all four reply "Hero". When asked "Is the person on your right a Hero or a Villain?", all four reply "Villain". How many Heroes are present?

Y11/9 There are a certain number of red balls, green balls and blue balls in a bag. Of the balls in the bag, $\frac{1}{3}$ are red and $\frac{2}{7}$ are blue. The number of green balls in the bag is 8 less than twice the number of blue balls. How many green balls are in the bag?

Y11/10 At 12:00 noon, Anna and Bill left home and walked in the same direction. Anna walked at 4 km/h and Bill walked at 3 km/h. At 12:15 their dog Dexter, running at 6 km/h, left home to run after them. The dog ran until it caught up to Anna, then it ran back to Bill. (In his excitement, Dexter lost no time in turning around once he reached Anna.) At what time did Bill meet Dexter on Dexter's way back?

Y11/11 Three of the vertices of a parallelogram are (0,1), (1,2), and (2,1). What is the area of the parallelogram?

Y11/12 On each spin of the spinner shown, the arrow is equally likely to stop on any one of the four numbers. Deanna spins the arrow on the spinner twice. She multiplies together the two numbers on which the arrow stops. Which product is most likely to occur?



Y11/13 The regular price for a bicycle is \$320. The bicycle is on sale for 20% off. The regular price for a helmet is \$80. The helmet is on sale for 10% off. If Sandra bought both items on sale, what is her percentage savings on the total purchase?

Y11/14 If $512^x = 64^{240}$, what is the value of x ?

Y11/15 what is product of the roots of the equation
 $(x - 4)(x - 2) + (x - 2)(x - 6) = 0$?

Y11/16 When three consecutive integers are added, the total is 27. What is the result when the same three integers are multiplied?

Y11/17 Fifty numbers have an average of 76. Forty of these numbers have an average of 80. What is average of the other ten numbers?

Y11/18 In an election for class president, 61 votes are cast by students who are voting to choose one of four candidates. Each student must vote for only one candidate. The candidate with the highest number of votes is the winner. What can be the smallest number of votes the winner receive?

Y11/19 A car leaves a starting point and drives at 60 km/hour. A second car leaves the same starting point some time later following the first car at a speed of 75 km/hour. It catches the first car after traveling a distance of 30 km. How many minutes later did the second car leave?

Y11/20 A truck is half full of sand. Another 2 cubic meters of sand is put into the truck making the truck two thirds full. How many cubic meters of sand can the truck hold?

TIE BREAKER

Y11/21 There are 81 cars in the MHCC parking lot, which are all TOYOTA, NISSAN, or FIAT. There are half as many TOYOTA as NISSAN. The number of FIAT is 80% of the number of TOYOTA and NISSAN together. How many of the 81 cars are NISSAN?

Y11/22 A bin contains 10 kg of peanuts. 2 kg of peanuts are removed and 2 kg of raisins are added and thoroughly mixed in. Then 2 kg of this mixture are removed and 2 kg of raisins are added and thoroughly mixed in again. What is the ratio of the mass of peanuts to the mass of raisins in the final mixture?
