**FMA TMC FINALS**

**YEAR 11– 2015**

Y11/1 Moira leans a 25 m ladder against a vertical wall with the bottom of the ladder 7m from the wall. As she pulls the bottom of the ladder away from the wall, the top of the ladder slides 4 m down the wall. How far did she pull the bottom of the ladder from its original position?

Y11/2 In the diagram, PQS is a straight line. What is the value of ?



Y11/3 Line is perpendicular to line . If the slope of is , and the slope of is , find the value of .

Y11/4 One leg of a right triangle exceeds the other leg by four inches.  The hypotenuse is 20 inches.  Find the length of the shorter leg of the right triangle.

Y11/5 The square of a number is decreased by 15.  This value is twice the original number.  Find the number(s).

Y11/6 Ed works for an environmental protection agency which deals with land areas that have been contaminated by toxic waste.  The contaminated soil covers an area 1.62 acres.  Ed must remove the top 18 inches of soil in this area.  If each truck can haul 10 cubic yards of soil, how many full truckloads of contaminated soil will Ed be removing? (1 acre=43,560 squarefeet & 1 square yard = 9 square feet).

Y11/7 A guidance counselor is planning schedules for 30 students.  Sixteen students say they want to take French, 16 want to take Spanish, and 11 want to take Latin.  Five say they want to take both French and Latin, and of these, 3 wanted to take Spanish as well.  Five want only Latin, and 8 want only Spanish.  How many students want French only?

Y11/8 A bag contains 3 white balls, 4 green balls and 5 red balls. Three balls are drawn from the bag without replacement.Find the probability that the balls are all the same color.

Y11/9 From the data given below find the interquartile range.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Height (cm) | 150 ≤ h < 155 | 155 ≤ h < 160 | 160 ≤ h < 165 | 165 ≤ h < 170 | 170 ≤ h < 175 |
| Frequency | 4 | 22 | 56 | 32 | 5 |

Y11/10 There are  20  rows of seats in a concert hall with  20  seats in the first row,  21  seats in the second row,  22  seats in the third row, and so on. In total,  how many seats are there in the concert hall?

Y11/11 If , find

Y11/12 Find the coordinates of the center of the circle with the equation

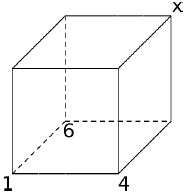
Y11/13 You fill up your car with 15 gallons of premium gasoline and fill up a 5 gallon gas can with regular gasoline for various appliances around the house. You pay the cashier $42. The price of regular gasoline is 20 cents less per gallon that the price of premium gasoline. Find the price per gallon of premium gasoline.

Y11/14 There are 30 people in a room, 60% of whom are men. If no men enter or leave the room, how many women must enter the room so that 40% of the total number of people in the room are men?

Y11/15 Find all values of for which the matrix is singular.

Y11/16 and are integers so that Find values for m and n.

Y11/17 The vertices of a cube are numbered 1 to 8 in such a way that the result of adding the four numbers of the vertices of a face is the same for all faces Numbers 1, 4 and 6 are already set on some vertices as shown. What is the value of ?



Y11/18 In the equation,  each letter stands for a different digit (0, 1, 2, ..., 9). How many different ways are there to choose the values of the letters?

Y11/19 Aliti and Sera start, at the same time, on a bicycle trip from Labasa to Dreketi, 90

km away. Aliti can ride 2 km faster than Sera. Aliti reaches Dreketi before Sera and immediately turns to meet her friend. She reaches Sera 10 km from Dreketi. Assuming that they each maintain their same speeds throughout the trip, how fast was Sera cycling (in km/h)

Y11/20 A positive integer has three digits. The product of the digits is 135. What is the sum of the digits?

Tie Breaker

Y11/21 Robert wanted to buy Mandy a gold bracelet while it was on sale for $160 off the regular price. He planned to pay it off with 2 equal monthly payments of $340. Instead, it went on sale for only $75 off the regular price, and he paid for it with 5 equal monthly payments. How much was each of his monthly payments?

Y11/22 There were 60 birds on three trees. At some moment 6 birds flew away from the

first tree, 8 birds flew away from the second tree, and 4 birds flew away from the third tree. After that, it turned out that the number of birds on each tree was the same. How many birds were there on the second tree in the beginning?