**FMA TMC FINALS**

**YEAR 12– 2015**

Y12/1 The square of a number is decreased by 15.  This value is twice the original number.  Find the number(s).

Y12/2 Find the coordinates of the center of the circle with the equation

Y12/3 Find all values of for which the matrix is singular.

Y12/4 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.

Y12/5 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?

Y12/6 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).

Y12/7 are three consecutive terms in a geometric sequence. Calculate the value of .

Y12/8 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.

Y12/9 The sum of five consecutive integers is equal to the sum of the next three consecutive integers. What is the greatest of these eight numbers?

Y12/10 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?

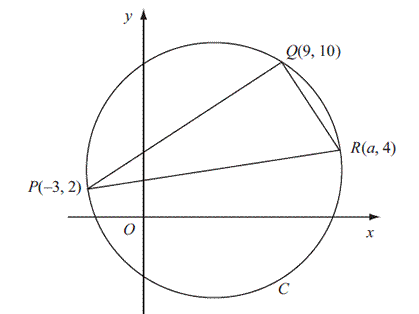
Y12/11 Two cyclists start biking from a trail's start 3 hours apart. The second cyclist travels at 10 kilometers per hour and starts 3 hours after the first cyclist who is traveling at 6 kilometers per hour. How much time (in hours) will pass before the second cyclist catches up with the first from the time the second cyclist started biking?

Y12/12 Tomu owes $5000 and Michael owes $3000. If Tomu had 2/3 of Michael’s money in addition to his own, he could exactly pay all his debts; if Michael had ½ of Tomu’s money in addition to his own, he could pay all but $100 of his debts. What is the total amount of money Tomu and Michael have?

Y12/13 Given that , what is the value of

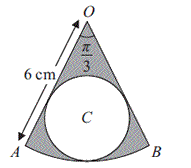
Y12/14 Given that Find the value(s) of .

Y12/15 The points and lie on the circle , as shown in the below figure. Given that is a diameter of , find the value of



Y12/16 A girl saves money over a perios of 200 weeks. She saves 5 cents in week 1, 7 cents in week 2, 9 cents in week 3, 11 cents in week 4 and son on until week 200. What is her total savings in dollars ($) over the complete 200 week period.

Y12/17 The figure below consists of a sector of a circle centre , of radius 6cm, and angle . The circle C, inside the sector, touches the two straight edges, and , and the arc as shown. Find the radius of the circle ?



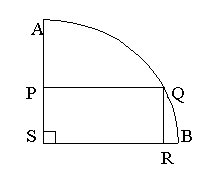
Y12/18 Find the sum:

Y12/19 can do a work in 16 days. In how many days will the work be completed by if the efficiency of is 60% more than that of ?

Y12/20 If what is the exact of ?

Tie Breaker

Y12/21 ASB is a quarter circle. PQRS is a rectangle with sides PQ = 8 and PS = 6. What is the length of the arc AQB ?



Y12/22 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?