**FMA TMC FINALS**

**YEAR 13– 2015**

Y13/1 If , what is the value of ?

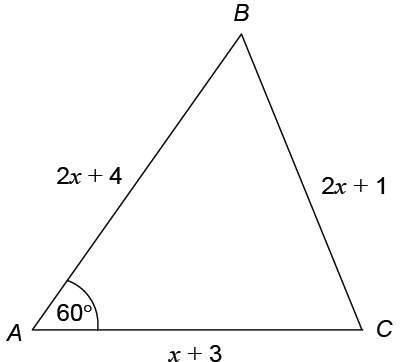
Y13/2 Each student in a class of 26 students wrote 2 different tests. It is known that

* 16 students passed the first test.
* 22 students passed the second test.
* No students failed both tests.

What is the number of students who passed both tests ?

Y13/3 An object is transformed by reflection in the line followed by enlargement about the origin with scale factor 2. What is the matrix of the combined transformation?

Y13/4 In the triangle ABC the length of side and the angle as shown in the figure below. Find the exact value of .



Y13/5 Sidney received so many flowers for her birthday that they wouldn't all fit on her desk. By lunch, her office was decorated with 9 flower bouquets, 7 of which were dandelion bouquets. If Sidney randomly selected 6 bouquets to take home, what is the probability that all of them are dandelion bouquets?

Y13/6 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).

Y13/7 Find the coordinate of the minimum point on the curve .

Y13/8 is a factor of the polynomial . Find the value of

Y13/9 Evaluate

Y13/10 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?

Y13/11 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?

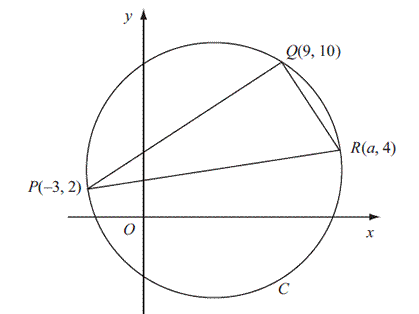
Y13/12 In how many different ways can the alphabets of the word **MISSISSIPPI** be arranged?

Y13/13 Find the values of c so that the function

is continuous everywhere.

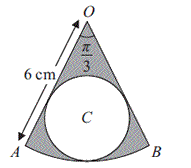
Y13/14 Given that Find the value(s) of .

Y13/15 The points and lie on the circle , as shown in the below figure. Given that is a diameter of , find the value of



Y13/16 A steamer is going downstream in a river and cover a distance between two villages in 20 hours and same distance it covers in 25 hours when he return back in upstream if the speed of the river is 4 km/h. Find the distance between two villages.

Y13/17 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 ?



Y13/18 Find the sum:

Y13/19 In three more years, Miguel's grandfather will be six times as old as Miguel was last year. When Miguel's present age is added to his grandfather's present age, the total is 68. How old is Miguel's grandfather now?

Y13/20 Tom is twice as good a workman as Peter and together they finish a piece of work in 18 days.In how many days will Tom alone finish the work.

Tie Breaker

Y13/21 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?

Y13/22 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 ?