**Fiji Mathematics Team Competition - Finals**

**YEAR 11– 2016**

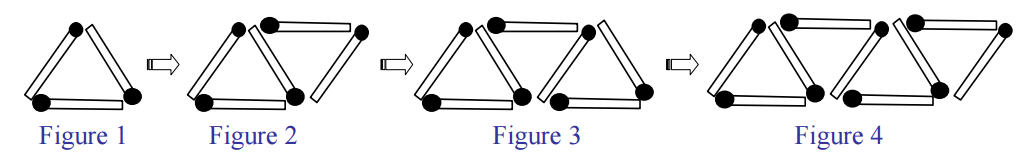
Y11/1 If determine the value of

Y11/2 20 can be written as the sum of two squares: 20 = 4 + 16 = 22 + 42 .In how many different ways (ignore the order) can 85 be written as the sum of two squares?

Y11/3 There were 60 birds on three trees. At some moment 6 birds flew away from the

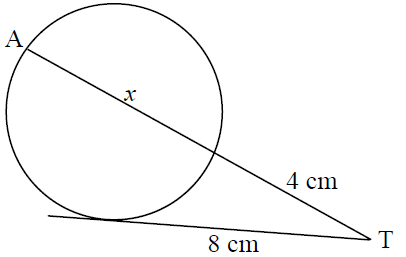
first tree, 8 birds flew away from the second tree, and 4 birds flew away from the third tree. After that, it turned out that the number of birds on each tree was the same. How many birds were there on the second tree in the beginning?

Y11/4 The figures below are built with matches. How many matches are needed to build the 45th figure in this sequence?



Y11/5 When the items in a box are put in groups of 3 or 5 or 6, there is always one item left over. How many items are in the box if there are fewer than 50?

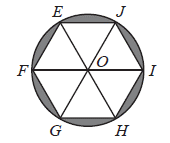
Y11/6 The figure given below shows a chord and a tangent intersecting at T. what is the length of line segment AT?



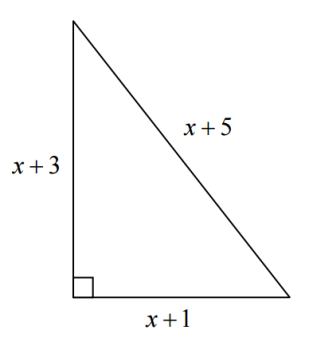
Y11/7 For a positive integer , is defined as the exponent of the largest power of 3 that divides . For example, since so divides 126, but does not. What is the value of

Y11/8 In the diagram, a circle with centre O has radius 6. Regular hexagon EFGHIJ has

sides of length 6 and vertices on the circle. Determine the exact area of the shaded region.



Y11/9 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?

Y11/10 Determine the value of *x*

Y11/11 Aclassroom hasarectangular array of desks*. A*student noticesthattherearethree deskstoherright*,*twotoher left*,*ﬁve desksin frontof herand two behind her*.* How many desks are in theroom*?*

Y11/12 If of 60 is 12, then what is 15% of ?

Y11/13 How many multiples of 4 are there between 1 and 999 ?

Y11/14 How many of the positive divisors of 128 are perfect squares larger than 1?

Y11/15 A total of n points are equally spaced around a circle and are labelled with the integers 1 to n, in order. Two points are called diametrically opposite if the line segment joining them is a diameter of the circle. If the points labelled 7 and 35 are diametrically opposite, then n equals

Y11/16 Box 1 contains one gold marble and one black marble. Box 2 contains one gold marble and two black marbles. Box 3 contains one gold marble and three black marbles. Whenever a marble is chosen randomly from one of the boxes, each marble in that box is equally likely to be chosen. A marble is randomly chosen from Box 1 and placed in Box 2. Then a marble is randomly chosen from Box 2 and placed in Box 3. Finally, a marble is randomly chosen from Box 3. What is the probability that the marble chosen from Box 3 is gold?

Y11/17 Banuve runs 16 km in 1.5 hours. He runs the first 10 km at an average speed of 12 km/h. What is his average speed for the last 6 km?

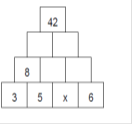
Y11/18 A fish tank, in the shape of a rectangular prism, has a base measuring 20 cm by 40cm with a height of 30 cm. The tank sits on a horizontal table and is half full of water. If 4000 cm3 of water is added, what is the new depth of the water?

Y11/19 A sequence is given by . If , find the value of .

Y11/20 A palindrome is a whole number that reads the same forwards or backwards, e.g. 474. How many 3-digit palindromes are there?

Tie Breaker

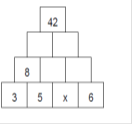
Y11/21 In the figure the number 8 is obtained by adding the two numbers directly below it. The other numbers in the top three rows can be obtained in the same way. What is the value of x?



Y11/22 Sarah started school at the age of five. She spent one quarter of her life being educated, and went straight into work. After working for one half of her life, she lived for fourteen happy years after retiring.

How old was she when she retired?

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