Maths Workshop

September 10th, 6:00pm to 8:00pm.
University of Canterbury, Erskine room 446.

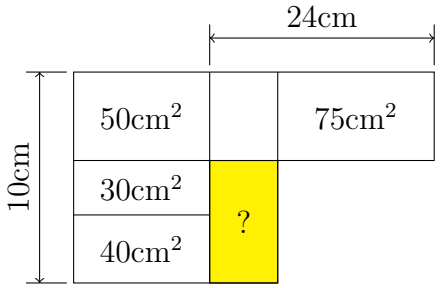
Problems

1. Write 10 as the sum of positive real numbers so as to maximize their product.

2. If a, b and c are all positive integers, then how many solutions are there to the following equation?

$$a + 2b + 4c = 1024.$$

3. Find the area of the shaded rectangle.



4. How many positive integers are divisors of 50000?

5. The sum of the reciprocals of two real numbers is -1, and the sum of their cubes is 4. What are the numbers?

6. Does there exist a set of 8 positive integers between 1 and 18 such that the difference between any two of them is either less than 7 or more than 11.

7. Four circles are constructed with the sides of a convex quadrilateral as the diameters. Does there exist a point inside the quadrilateral that is not inside any of the circles? Justify your answer.

8. Find all integer solutions to the equation $(a^2 - 1)(b^2 - 1) = (c^2 + 1)$.