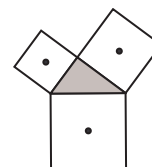


Problems, October 2008

Problem 1. Solve for x : $\frac{x-a}{b} + \frac{x-b}{a} = \frac{b}{x-a} + \frac{a}{x-b}$.

Problem 2. Every point on the x -axis is coloured black or white. Show that there are two distinct points X, Y such that X, Y , and the point halfway between X and Y all have the same colour.

Problem 3. Outward facing squares are erected on the sides of a right-angled triangle whose legs have length a and b . What is the area of the triangle whose vertices are the midpoints of these squares?



Problem 4. Find all integers n such that $n + 16$ is a perfect square and no prime greater than 3 divides n . (A correct list is not sufficient: one needs to show that there are no others.)