

MATHEMATICS ENRICHMENT CLUB.
Problem Sheet 4, May 28, 2018

1. Find the number of solutions to the equation

$$x^2y^3 = 6^{12};$$

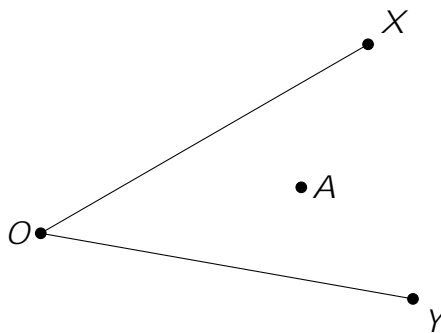
where x and y are positive integers.

(AMC 2006 Intermediate Division Q2)

2. $\frac{1}{a + \frac{1}{b + \frac{1}{c + \frac{1}{d}}}} = \frac{11}{42}$, where a, b, c and d are positive integers. Find $a + b + c + d$.

(AMC 2006 Intermediate Division Q1)

3. As shown in the diagram, $\angle XOY$ is acute and A is a point lying inside this angle.



Find a point B on the side OX and a point C on the side OY such that the perimeter of the triangle ABC is minimised.

(Adapted from Kiselev's Geometry Book 1: Planimetry)

4. What is the sum of all the digits used in writing down the numbers from one to 9999?

Senior Questions

1. $x^2 - 19x + 94$ is a perfect square and x is an integer. What is the largest value of x ?