

Pi Math Contest - Fermat Division Sample Problems

1. Find the remainder when 20182018 is divided by 101.
2. In triangle $\triangle ABC$, one of the angles is twice another. If $\angle A = 54^\circ$, what is the sum of all possible values of the smallest angle of this triangle, in degrees?
3. The roots of the polynomial $x^3 - 12x^2 + ax - 28$ form an arithmetic sequence. What is a ?
4. Alpha the Penguin will take a shortest path in a grid from $(0, 0)$ to $(5, 5)$. Along her path, except at the starting point, she never goes through a point one of whose coordinates is twice the other. How many different shortest paths can she take with this condition?
5. Richard is going up on an escalator. If he walks up with a constant speed, it takes him 30 seconds. If he walks down with the same constant speed, it takes him 120 seconds. How many seconds would it take him if he stays still on the escalator?