



MONTGOMERY COUNTY MATHEMATICS LEAGUE

Individual for Contest # 1

(No Calculators)

2015-2016

Time: 10 minutes

1. If $x + y = 3$ and $xy = 2$, find the value of $x^3 + y^3$.

2. Working together Alice, Betty, and Cathy can finish a certain job in the allotted time. If Alice alone could finish the job in 12 hours more than the allotted time, Betty alone could finish the job in 2 hours more than the allotted time, and Cathy alone could finish in twice the allotted time, find the number of hours in the allotted time.



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3. The sum of the squares of seven consecutive positive integers is 9100. Find the smallest of these seven integers.
4. In ten years, Carl will be twice as old as Bill is now. Ten years ago, Al was twice as old as Bill was then. The present sum of their ages is 130 years. How old is Bill now (in years)?



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5. In isosceles triangle ABC, with base AC, P is a point on BC between B and C. If $CA = AP = PB$, find $m\angle B$ in degrees .

6. Find the least positive value of x for which $\sin 80^\circ = 4 \sin 20^\circ \sin 70^\circ \sin x^\circ$.