

Farmer Olympiad 2022 Round 3 Answers

1. 133771 by Chinese Remainder Theorem
2. Trig addition formulae-expansion of $f(\sin(\sin(x)) \cos(\cos(x)) + \sin(\cos(x)) \cos(\sin(x)) + \cos(\sin(x)) \cos(\cos(x)) - \sin(\sin(x)) \sin(\cos(x)))$,
3.
 - i. 627
 - ii. 64
 - iii. 64
 - iv. Answers to (ii) and (iii) are the same, suggesting somehow that these two results may be related (they are.)