Friday Quiz Week 24

(Geometry students solve any two Problems but PC and CP students must solve all)

Problem 1: Show the details of your strategy. (5 points= 4pts work + 1pt answer)

Josh writes the numbers $1, 2, 3, \ldots, 99, 100$. He marks out 1, skips the next number (2), marks out 3, and continues skipping and marking out the next number to the end of the list. Then he goes back to the start of his list, marks out the first remaining number (2), skips the next number (4), marks out 6, skips 8, marks out 10, and so on to the end. Josh continues in this manner until only one number remains. What is that number?

(A) 13   (B) 32   (C) 56   (D) 64   (E) 96

Problem 2: Show the details of your strategy. (5 points= 4pts work + 1pt answer) Show the graph

All three vertices of $\triangle ABC$ lie on the parabola defined by $y = x^2$, with A at the origin and $\overline{BC}$ parallel to the x-axis. The area of the triangle is 64. What is the length of BC?

(A) 4   (B) 6   (C) 8   (D) 10   (E) 16

Problem 3: Show the details of your strategy. (5 points= 4pts work + 1pt answer) Show the figure.

A quadrilateral has vertices $P(a, b)$, $Q(b, a)$, $R(-a, -b)$, and $S(-b, -a)$, where a and b are integers with $a > b > 0$. The area of $PQRS$ is 16. What is $a + b$?

(A) 4   (B) 5   (C) 6   (D) 12   (E) 13