

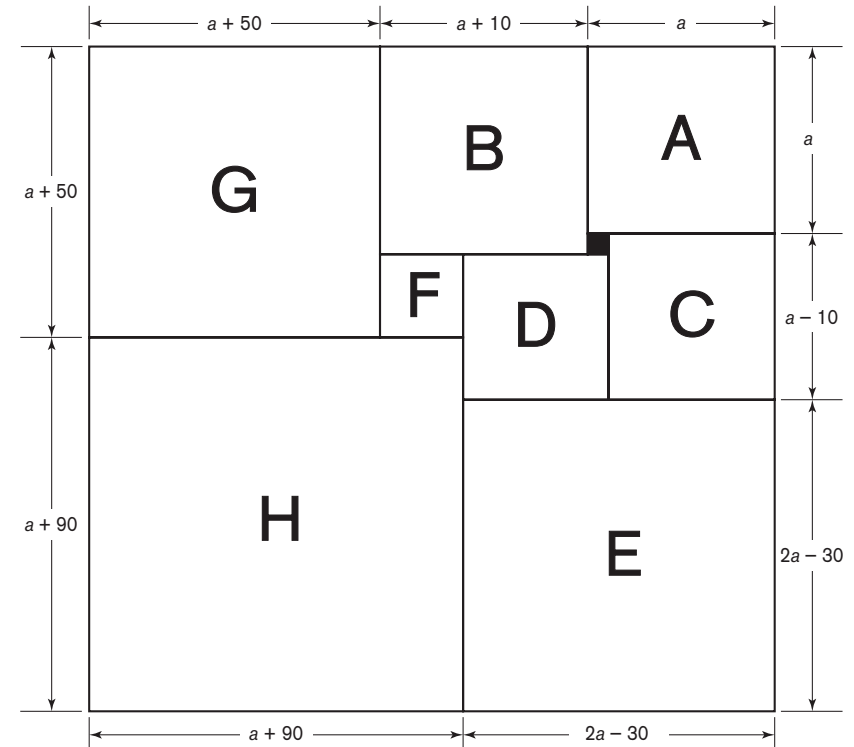
MATHCOUNTS 2017–2018 HB Poster Solution

SQUAREA ZOO **MATHCOUNTS®**

SQUAREA ZOO ISN'T SQUARE BUT HAS 9 SQUARE EXHIBITS.
THE PARROT EXHIBIT 🦜 IS 10x10.
WHAT IS THE TOTAL AREA OF SQUAREA ZOO?

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We know that the parrot exhibit (shaded above) is a square of side length 10. Let's start with square A in the upper right corner and say it has side length a . We can see that square B has side length $a + 10$, and square C has side length $a - 10$. That means that square D has side length $a - 10 - 10 = a - 20$, and square E has side length $a - 10 + a - 20 = 2a - 30$. It follows that square F has side length $(a + 10 + a) - (2a - 30) = 2a + 10 - 2a + 30 = 40$. Square G, then, has side length $(a + 10) + 40 = a + 50$. Finally, square H has side length $(a + 50) + 40 = a + 90$. We can now write two different expressions for the length of the zoo and set them equal to each other. Doing so yields $(a + 50) + (a + 90) = a + (a - 10) + (2a - 30)$. Solving for a , we get $2a + 140 = 4a - 40 \rightarrow 2a = 180 \rightarrow a = 90$. So, the zoo has length $(a + 50) + (a + 90) = 90 + 50 + 90 + 90 = 320$ and width $(a + 50) + (a + 10) + a = 90 + 50 + 90 + 10 + 90 = 330$. Therefore, the total area of Squarea Zoo is $320 \times 330 = 105,600$.