WSMA Math Bowl – March 7, 2015

# HS Creativity Round

| 1 | Prove that if you have any positive integers x and y and smallest positive integer a such that the remainder when x^a is divided by y is 1, then, for any positive integer b such that x^b is divided by y has a remainder of 1, a divides b. |
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| 2 | If you have two integers a, and b. Show that you can find integers ax+by = 1 if and only if a and b are relatively prime. |
| 3 | 2n+2 points are placed in a plane, where n is a positive integer, and no 3 points are collinear. Prove that there exists two points such that the line that goes through both points cuts the total set of points in half. |
| 4 | Find a way you can use six '4's and any mathematical expression to get the number 25. |
| 5 | A 6 by 6 square board is tiled completely with 18 2 by 1 square dominos. Prove that at least one horizontal or vertical line can be drawn along the edges of the dominos that divides the board into 2 regions, without cutting any dominos in half. |