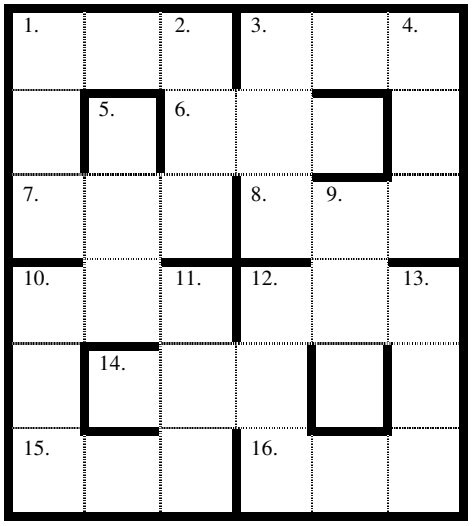
Settling a Score by Brimstone

Brimstone has made a list of the lengths of the sides of twenty right-angled triangles. To do this he used the fact that sides with lengths 2ab, $a^2 - b^2$ and $a^2 + b^2$ where a and b are whole numbers always give a Pythagorean triple. For example if a=12 and b=7 then a triangle with sides 168, 95 and 193 is right-angled. i.e. $168^2 + 95^2 = 193^2$ He has labelled the shortest side, the middle length side and the hypotenuse s_1, m_1 and h_1 respectively for the first triangle, s_2, m_2 and h_2 respectively for the second triangle etc. The letters A to K represent the first eleven prime numbers in an order to be determined. There are no leading zeros but two different triangles have the same length hypotenuse. Both grids need to be filled.

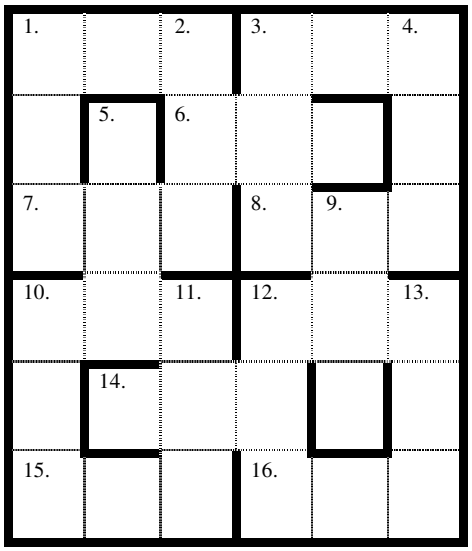


ACROSS

1. h_1: $I^2 + J^2$
3. h_2: $B^2 + C^2$
6. h_3: $F^2 + G^2$
7. h_4: $C^2 + F^2 = H^2 + K^2$
8. h_5: $A^2 + B^2$
10. h_6: $G^2 + H^2$
12. h_7: $B^2 + I^2$
14. h_8: $D^2 + J^2$
15. h_9: $F^2 + K^2 = A^2 + J^2$
16. h_{10}: $E^2 + I^2$

DOWN

1. h_{11}: $G^2 + J^2$
2. h_{12}: $B^2 + F^2$
3. h_{13}: $F^2 + H^2$
4. h_{14}: $C^2 + K^2$
5. h_{15}: $G^2 + K^2$
9. h_{16}: $A^2 + H^2$
10. h_{17}: $B^2 + D^2$
11. h_{18}: $H^2 + K^2$
12. h_{19}: $(K-B)^2 + D^2$
13. h_{20}: $F^2 + I^2$



ACROSS

1. m_1: $J^2 - I^2$
3. m_{12}: 2FB
6. $s_{16} + s_{20}$
7. $s_{13} = s_{14}$
8. $s_9 + s_{19}$
10. s_8
12. s_{12}
14. m_{11}
15. $m_{14} - m_{16}$
16. m_{18}

DOWN

1. m_8
2. $s_{13} + s_{14} + s_{15}$
3. m_2
4. s_{18}: $K^2 - H^2$
5. $s_3 + m_{20}$
9. s_{11}
10. s_1: 2IJ
11. m_{13}
12. m_7
13. $m_3 - m_6$

To enter this competition, send your entry as an image or in list format, to quiz.man@ntlworld.com before the 8th August 2012. The first correct entry drawn from the hat will receive a copy of Armchair Crosswords by Afrit, which has been donated by the Crossword Centre.