

Re: SMSU Problem Corner (oops!)

Source: <http://sci.tech-archive.net/Archive/sci.math/2004-09/5502.html>

From: mjc (mjcohen_at_acm.org)

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Les Reid wrote:

- > *The original Challenge problem posted had a number of grievous errors. It*
- > *has been withdrawn and a new, similar (and one hopes, correct) puzzle has*
- > *been posted at*
- >
- > <http://math.smsu.edu/~les/Challenge.html>
- >
- > *Sorry about that!*
- >

Unless I made a mistake ($p > .5$), there is no solution to the problem.

The only 4-digit squares with the same first and last digits
and 5-digits triangular numbers with the same first and last digits
both having the same second-highest digit seem to be as shown here:

VEIR is a perfect square

SECHS is triangular

NEUN is a perfect square

What is DREI?

Squares from 1000 through 9999

Look from 32 through 99

68 squares

Tris from 10000 through 99999

Look from 141 through 446

306 triangular numbers

Squares with same first and last digits

39 → 1521

41 → 1681

68 → 4624

75 → 5625

97 → 9409

Tris with same first and last digits

141 → 10011

146 → 10731

153 → 11781

158 → 12561

161 → 13041

166 → 13861

173 -> 15051
178 -> 15931
181 -> 16471
186 -> 17391
193 -> 18721
198 -> 19701
257 -> 33153
262 -> 34453
277 -> 38503
282 -> 39903
325 -> 52975
329 -> 54285
330 -> 54615
334 -> 55945
345 -> 59685
348 -> 60726
351 -> 61776
356 -> 63546
363 -> 66066
368 -> 67896
371 -> 69006
407 -> 83028
412 -> 85078

Possible # 1: square 39->1521, tri 412->85078

Possible2 # 1: square 39->1521, tri 412->85078, square 39->1521

Possible2 # 2: square 39->1521, tri 412->85078, square 50->2500

Possible2 # 3: square 39->1521, tri 412->85078, square 81->6561

Possible2 # 4: square 39->1521, tri 412->85078, square 87->7569

Possible # 2: square 75->5625, tri 181->16471

Possible2 # 5: square 75->5625, tri 181->16471, square 40->1600

Possible2 # 6: square 75->5625, tri 181->16471, square 41->1681

Possible2 # 7: square 75->5625, tri 181->16471, square 51->2601

Possible2 # 8: square 75->5625, tri 181->16471, square 60->3600

Possible2 # 9: square 75->5625, tri 181->16471, square 68->4624

Possible2 # 10: square 75->5625, tri 181->16471, square 75->5625

Possible2 # 11: square 75->5625, tri 181->16471, square 93->8649

Possible2 # 12: square 75->5625, tri 181->16471, square 98->9604

Possible # 3: square 97->9409, tri 329->54285

Possible2 # 13: square 97->9409, tri 329->54285, square 38->1444

Possible2 # 14: square 97->9409, tri 329->54285, square 49->2401

Possible2 # 15: square 97->9409, tri 329->54285, square 59->3481

Possible2 # 16: square 97->9409, tri 329->54285, square 67->4489

Possible2 # 17: square 97->9409, tri 329->54285, square 74->5476

Possible2 # 18: square 97->9409, tri 329->54285, square 80->6400

Possible2 # 19: square 97->9409, tri 329->54285, square 92->8464

Possible2 # 20: square 97->9409, tri 329->54285, square 97->9409

Possible # 4: square 97->9409, tri 330->54615

Possible2 # 21: square 97->9409, tri 330->54615, square 38->1444

Possible2 # 22: square 97->9409, tri 330->54615, square 49->2401

Possible2 # 23: square 97->9409, tri 330->54615, square 59->3481

Possible2 # 24: square 97->9409, tri 330->54615, square 67->4489

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Possible2 # 25: square 97→9409, tri 330→54615 , square 74→5476

Possible2 # 26: square 97→9409, tri 330→54615 , square 80→6400

Possible2 # 27: square 97→9409, tri 330→54615 , square 92→8464

Possible2 # 28: square 97→9409, tri 330→54615 , square 97→9409

None of the second squares with the second-highest digit matching have digits distinct from previously occurring ones.

Martin Cohen