

Making Tracks

THIS ISSUE'S PUZZLE

Consider three cities: A, B, and C. B is 30 miles east of A. C is 40 miles north of the precise center between A and B. (Disregard the earth's curvature; assume we're talking about a flat world with parallel and Euclideanly straight longitude and latitudes.)

1. It's desirable to be able to connect each city by rail, but we want to minimize the amount of track required. Can you design the shortest railroad track that would enable connection between any two cities? What is the amount of track required for such?

2. Now suppose there's also a city D that's 40 miles north of A, and a city E that's 40 miles north of B. Can you design the shortest railroad track that would enable connection between any of the four cities, situated in a rectangle, of A,B,D, and E? Is there more than one solution? What's the amount of track required for such?

***Very difficult:** Can you design the shortest track that would be required to enable connection between any of the three cities A, B, and D? What is the amount of track required for such?

Please submit your solutions via e-mail to PuzzZles@aol.com (that's with 3 z's!) or by mail to PUZZLES, 17 Ravine Rd., Great Neck, NY 11023. This issues solvers list will be limited to first 100 correct submissions; please submit answers as soon as possible to make the solvers list. And please send any ideas or any favorites for consideration for future issues to the same addresses.

LAST ISSUE'S PUZZLE

The Nose Knows. Dalakaduk and his wife Manaluk invited five other Eskimo husband-wife couples over. These Eskimos greet one another, regardless of sex, with a "kunik," that is by rubbing noses. Spouses do not greet each other and nobody greets the same person more than once.

Nyla and her husband Chuyulak were among the invited couples. Dalakaduk at one point asked each of his guests, and his wife too, how many people they had each greeted. Oddly, each of them gave him a different numerical answer.

- a. How many of the guests had Manaluk greeted?
- b. Manaluk had greeted Chuyulak. Had Nyla greeted Dalakaduk?

Answer:

- a. Manaluk greeted 5 guests
- b. Nyla did not greet Dalakaduk

Solution:

Dalakaduk received different answers from the other 11 attendees. The most anyone could have greeted is 10 since people don't greet themselves or spouses. Thus Dalakaduk must have received 0,1,2,3,4,5,6,7,8,9,10 as response. The person saying 10 must have greeted (besides persons saying 1-9) the host himself—thus 0 must be that 10 person's spouse (since 10 greeted everyone except 0). The 0 person (who we now know is the spouse of 10) obviously did not greet the host.

Removing both the person saying 10 and the spouse who said 0, and deducting their greetings from the remaining nine people (i.e. deduct 1 from each) we are left with 0,1,2,3,4,5,6,7,8 (from the 1,2,3,4,5,6,7,8,9 group).

Here again, the person with 8 (originally 9) and the 0 person (originally 1) are spouses—the 8 person must have greeted 0 person; again that 8 person (originally 9) and the 0 person (originally 1) must be spouses. The original 9 person must have greeted the host; while the spouse at original 1 did not greet the host.

Continuing, we see same conclusion for original 2-8, 3-7, and 4-6 pairs (i.e. that they're spouses and higher number



greeted the host.) Thus we're left with the original 5 group. Since all other couples have been matched off, the person originally saying 5 must be the host's wife; thus Manaluk greeted 5 people.

Manaluk's 5 greeted each of the 6-10 (otherwise they couldn't have expressed these figures) and Manaluk thus did not greet 0-4. Thus, Manaluk greeted the same people as her husband. Similarly, anyone she did not greet, her husband did not greet.

Solvers

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