

Twelve puzzles to work on paper

From *The Puzzles of Henry Dudeney* (Valice Classics). Each sheet has one puzzle in Dudeney's own words and space to work. Numbers are the book's; hints are in the book and in the free hints booklet; solutions are in the book.

1. A Post-Office Perplexity

Amusements in Mathematics, no. 1

In every business of life we are occasionally perplexed by some chance question that for the moment staggers us. I quite pitied a young lady in a branch post-office when a gentleman entered and deposited a crown on the counter with this request: "Please give me some twopenny stamps, six times as many penny stamps, and make up the rest of the money in twopence-halfpenny stamps." For a moment she seemed bewildered, then her brain cleared, and with a smile she handed over stamps in exact fulfilment of the order. How long would it have taken you to think it out?

Work here.

14. Average Speed

Amusements in Mathematics, no. 67

In a recent motor ride it was found that we had gone at the rate of ten miles an hour, but we did the return journey over the same route, owing to the roads being more clear of traffic, at fifteen miles an hour. What was our average speed? Do not be too hasty in your answer to this simple little question, or it is pretty certain that you will be wrong.

Work here.

19. Digits And Squares

Amusements in Mathematics, no. 77

1	9	2
3	8	4
5	7	6

It will be seen in the diagram that we have so arranged the nine digits in a square that the number in the second row is twice that in the first row, and the number in the bottom row three times that in the top row. There are three other ways of arranging the digits so as to produce the same result. Can you find them?

Work here.

34. The Haberdasher's Puzzle

The Canterbury Puzzles, no. 26



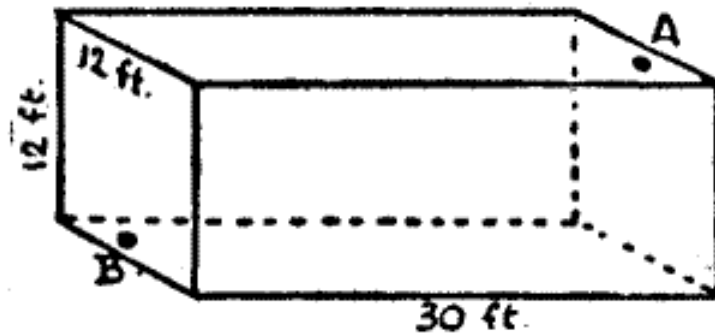
Many attempts were made to induce the Haberdasher, who was of the party, to propound a puzzle of some kind, but for a long time without success. At last, at one of the Pilgrims' stopping-places, he said that he would show them something that would "put their brains into a twist like unto a bell-rope." As a matter of fact, he was really playing off a practical joke on the company, for he was quite ignorant of any answer to the puzzle that he set them. He produced a piece of cloth in the shape of a perfect equilateral triangle, as shown in the illustration, and said, "Be there any among ye full wise in the true cutting of cloth? I trow not. Every man to his trade, and the scholar may learn from the varlet and the wise man from the fool. Show me, then, if ye can, in what manner this piece of cloth may be cut into four several pieces that may be put together to make a perfect square."

Now some of the more learned of the company found a way of doing it in five pieces, but not in four. But when they pressed the Haberdasher for the correct answer he was forced to admit, after much beating about the bush, that he knew no way of doing it in any number of pieces. "By Saint Francis," saith he, "any knave can make a riddle methinks, but it is for them that may to rede it aright." For this he narrowly escaped a sound beating. But the curious point of the puzzle is that I have found that the feat may really be performed in so few as four pieces, and without turning over any piece when placing them together. The method of doing this is subtle, but I think the reader will find the problem a most interesting one.

Work here.

52. The Spider and the Fly

The Canterbury Puzzles, no. 75



Inside a rectangular room, measuring 30 feet in length and 12 feet in width and height, a spider is at a point on the middle of one of the end walls, 1 foot from the ceiling, as at A; and a fly is on the opposite wall, 1 foot from the floor in the centre, as shown at B. What is the shortest distance that the spider must crawl in order to reach the fly, which remains stationary? Of course the spider never drops or uses its web, but crawls fairly.

Work here.

53. The Twenty-One Trees

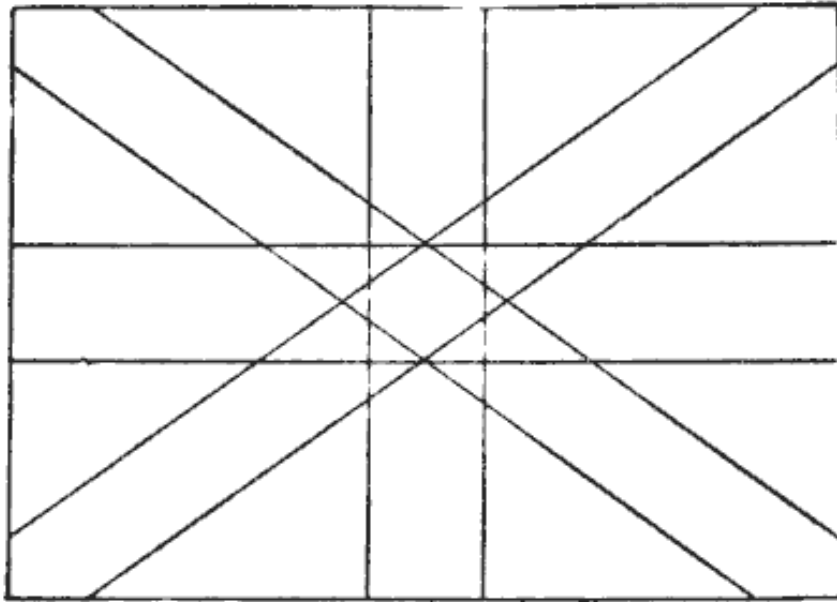
Amusements in Mathematics, no. 209

A gentleman wished to plant twenty-one trees in his park so that they should form twelve straight rows with five trees in every row. Could you have supplied him with a pretty symmetrical arrangement that would satisfy these conditions?

Work here.

59. The Union Jack

Amusements in Mathematics, no. 240



The illustration is a rough sketch somewhat resembling the British flag, the Union Jack. It is not possible to draw the whole of it without lifting the pencil from the paper or going over the same line twice. The puzzle is to find out just *how much* of the drawing it is possible to make without lifting your pencil or going twice over the same line. Take your pencil and see what is the best you can do.

Work here.

65. Crossing The Stream

Amusements in Mathematics, no. 373

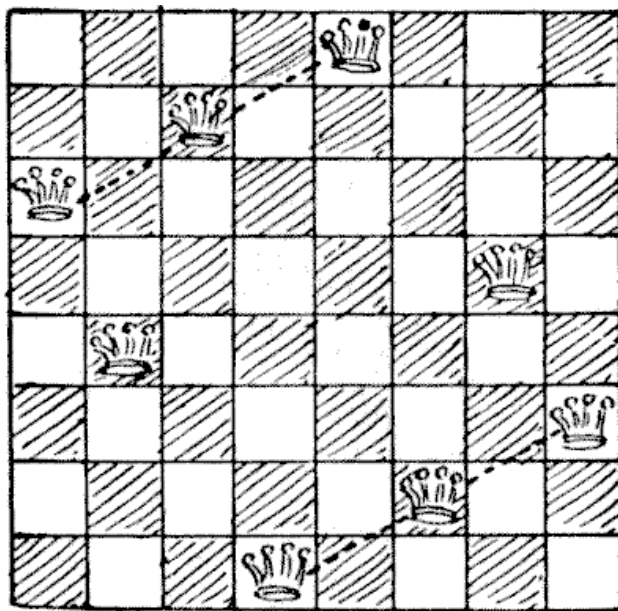
During a country ramble Mr. and Mrs. Softleigh found themselves in a pretty little dilemma. They had to cross a stream in a small boat which was capable of carrying only 150 lbs. weight. But Mr. Softleigh and his wife each weighed exactly 150 lbs., and each of their sons weighed 75 lbs. And then there was the dog, who could not be induced on any terms to swim. On the principle of “ladies first,” they at once sent Mrs. Softleigh over; but this was a stupid oversight, because she had to come back again with the boat, so nothing was gained by that operation. How did they all succeed in getting across? The reader will find it much easier than the Softleigh family did, for their greatest enemy could not have truthfully called them a brilliant quartette—while the dog was a perfect fool.

Work here.

78. The Eight Queens

Amusements in Mathematics, no. 300

The queen is by far the strongest piece on the chessboard. If you place her on one of the four squares in the centre of the board, she attacks no fewer than twenty-seven other squares; and if you try to hide her in a corner, she still attacks twenty-one squares. Eight queens may be placed on the board so that no queen attacks another, and it is an old puzzle (first proposed by Nauck in 1850, and it has quite a little literature of its own) to discover in just how many different ways this may be done. I show one way in the diagram, and there are in all twelve of these fundamentally different ways. These twelve produce ninety-two ways if we regard reversals and reflections as different. The diagram is in a way a symmetrical arrangement. If you turn the page upside down, it will reproduce itself exactly; but if you look at it with one of the other sides at the bottom, you get another way that is not identical. Then if you reflect these two ways in a mirror you get two more ways. Now, all the other eleven solutions are non-symmetrical, and therefore each of them may be presented in eight ways by these reversals and reflections. It will thus be seen why the twelve fundamentally different solutions produce only ninety-two arrangements, as I have said, and not ninety-six, as would happen if all twelve were non-symmetrical. It is well to have a clear understanding on the matter of reversals and reflections when dealing with puzzles on the chessboard.



Can the reader place the eight queens on the board so that no queen shall attack another and so that no three queens shall be in a straight line in any oblique direction? Another glance at the diagram will show that this arrangement will not answer the conditions, for in the two directions indicated by the dotted lines there are three queens in a straight line. There is only one of the twelve fundamental ways that will solve the puzzle. Can you find it?

Work here.

84. Counting The Rectangles

Amusements in Mathematics, no. 347

Can you say correctly just how many squares and other rectangles the chessboard contains? In other words, in how great a number of different ways is it possible to indicate a square or other rectangle enclosed by lines that separate the squares of the board?

Work here.

89. The Reve's Puzzle

The Canterbury Puzzles, no. 1



The Reve was a wily man and something of a scholar. As Chaucer tells us, “There was no auditor could of him win,” and “there could no man bring him in arrear.” The poet also noticed that “ever he rode the hindermost of the route.” This he did that he might the better, without interruption, work out the fanciful problems and ideas that passed through his active brain. When the pilgrims were stopping at a wayside tavern, a number of cheeses of varying sizes caught his alert eye; and calling for four stools, he told the company that he would show them a puzzle of his own that would keep them amused during their rest. He then placed eight cheeses of graduating sizes on one of the end stools, the smallest cheese being at the top, as clearly shown in the illustration. “This is a riddle,” quoth he, “that I did once set before my fellow townsmen at Baldeswell, that is in Norfolk, and, by Saint Joce, there was no man among them that could rede it aright. And yet it is withal full easy, for all that I do desire is that, by the moving of one cheese at a time from one stool unto another, ye shall remove all the cheeses to the stool at the other end without ever putting any cheese on one that is smaller than itself. To him that will perform this feat in the least number of moves that be possible will I give a draught of the best that our good host can provide.” To solve this puzzle in the fewest possible moves, first with 8, then with 10, and afterwards with 21 cheeses, is an interesting recreation.

Work here.

109. Jack And The Beanstalk

Amusements in Mathematics, no. 425



The illustration, by a British artist, is a sketch of Jack climbing the beanstalk. Now, the artist has made a serious blunder in this drawing. Can you find out what it is?

Work here.