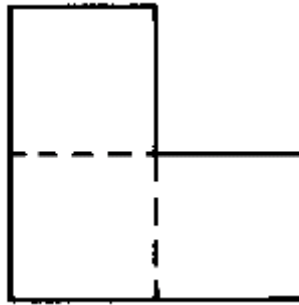


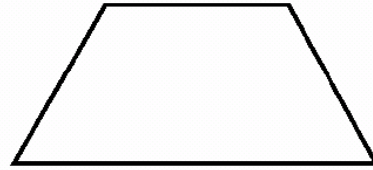
1. Divide each figure into four identical shapes.



(a) A right trapezoid



(b) Three squares

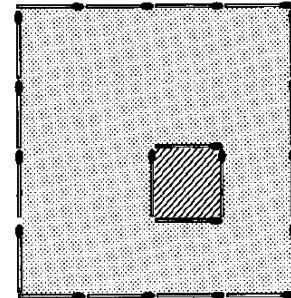


(c) half of a regular hexagon

2.

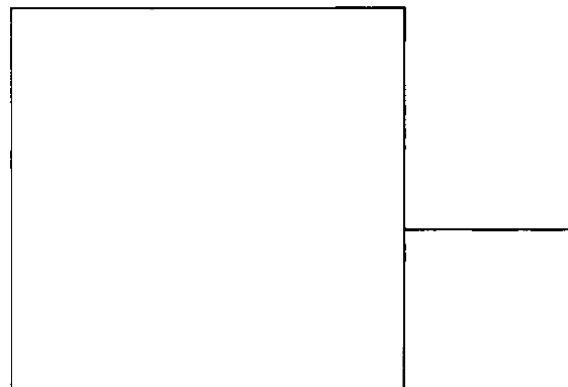
A square building site is represented by sixteen matches. The small square inside represents a pond which the builder wishes to retain. Planning permission has been given to build five houses and the builder wishes to divide the site, so that, apart from the pond, each house has a plot of land of an identical shape and size.

Show how this can be done by the addition of ten matches.



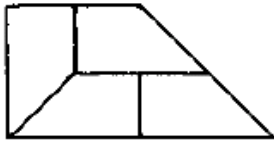
3.

On a piece of paper draw two squares next to each other as shown. Their relative sizes are not important. Now draw two straight lines to divide the figure into four pieces which can be fitted together as a jigsaw to form a single square.

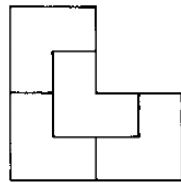


Keys

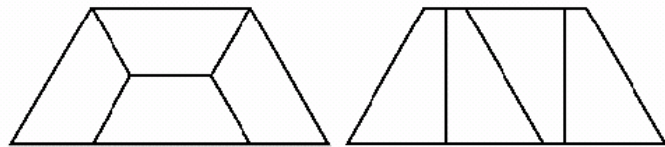
1.(a)



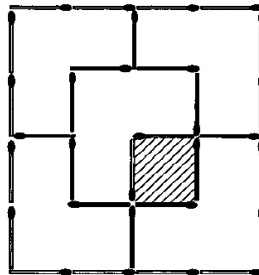
(b)



(c)

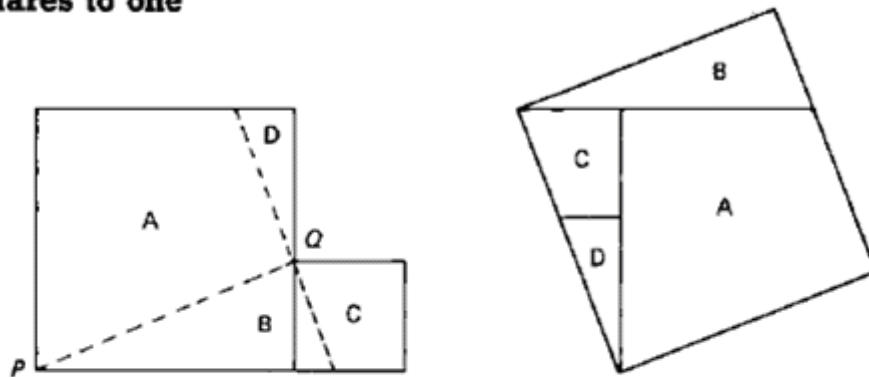


2.



3.

Two squares to one



One solution is shown, but many pairs of lines drawn at the same angles to the squares would do. As drawn, PQ is the hypotenuse of a right-angled triangle whose sides are equal to the two given squares, so by Pythagoras' theorem PQ will be the required length for the single square with area equal to the sum of the two given.

By suitably positioning the line pair it is possible to cut the original squares into only three pieces and obtain a solution to the problem of forming a single square. How?