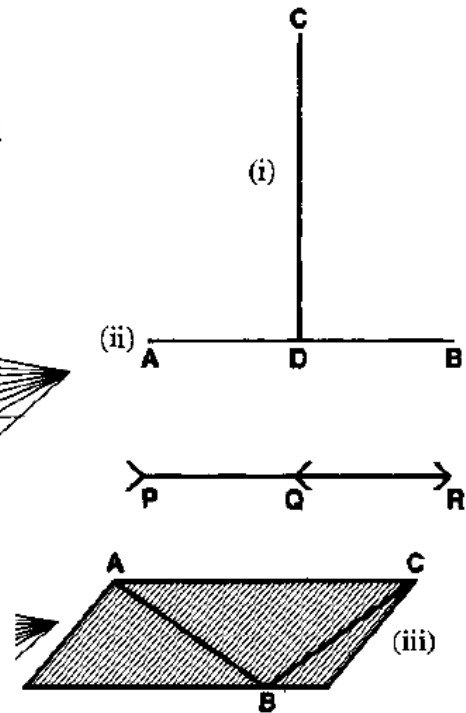
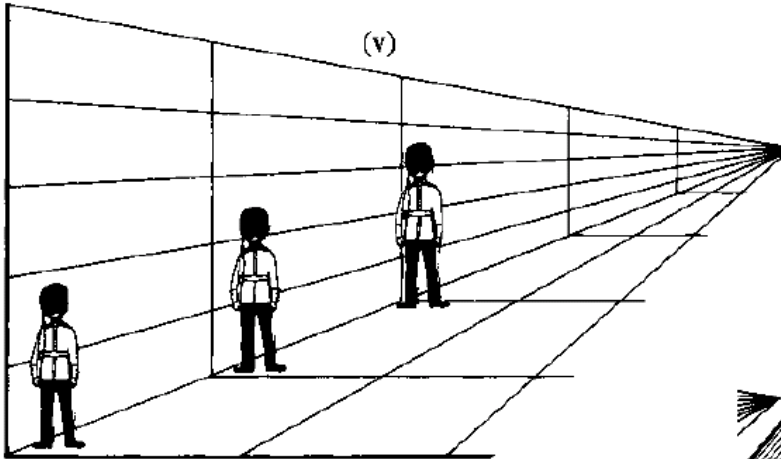


1.

Do your eyes deceive you?

How good are we at judging lengths and areas? Surely $CD > AB$ in (i) and $PQ > QR$ in (ii). And how about AB and BC in (iii)? Which of the soldiers in (v) is the tallest?



2.

Olive Orchard's cider measures

Olive Orchard's cider was renowned for its flavour and potency throughout the region and she had a steady stream of customers to her door. She was also notorious for her eccentric way of measuring out the cider for her customers. She had just two measures which she had inherited from her grandfather, one with a capacity of 4 litres, and one of 7 litres. Using these she was very skilled at measuring out any number of litres a customer ordered.

How would you use the measures to satisfy a customer who asked for 2 litres? No cider is to be wasted but you can, if you wish, pour some back into the barrel.

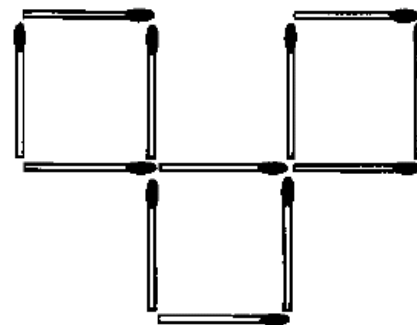


3.

Twelve matches have been arranged as shown to make 3 identical squares.

Show how you can move three matches to make an arrangement with: (a) 5 squares, (b) 7 squares.

How many matches do you need to move to make an arrangement with 6 squares identical in size to the original?



Keys

1.

Our eyes are easily fooled by the context of the parts of a drawing, but in all of these examples the parts compared are equal.

2.

- 1 Fill the 7-litre measure, then pour into the 4-litre measure, leaving 3 litres in the 7-litre measure.
- 2 Empty the 4-litre measure into the barrel, then pour 3 litres from the 7-litre measure into the 4-litre measure.
- 3 Fill the 7-litre measure and pour 1 litre from it into the 4-litre measure to fill it leaving 6 litres.
- 4 Empty the 4-litre measure into the barrel, then pour 4 litres into it from the 7-litre measure, leaving 2 litres.

3.

The wording of the puzzle is important. The first two parts do not say the squares have to be identical.

The last part is achieved by making a cube, and this requires the movement of 8 matches.

