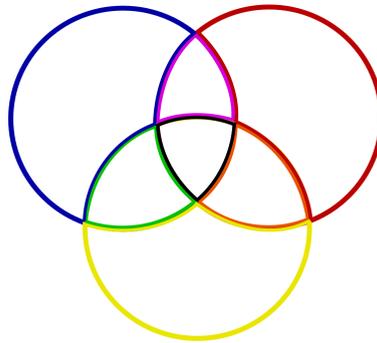


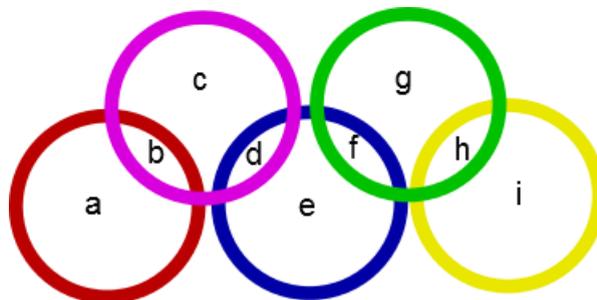
Place the digits 1 to 7, one in each region, so that the circles all have the same total.



Can you also show that:

- you cannot have a circle total of 16 with 4 in the centre?
- you cannot have circle totals greater than 19 or less than 13?
- you cannot have anything other than 1 in the centre for a circle total of 13?

## Five Rings



These five rings create nine regions, labelled *a* to *i* above. Using each of the digits 1 to 9 exactly once, can you place one number in each region so that **the sum of the numbers within each ring is the same?**

Can you find more than one solution?

Show that for any solution the sum of the numbers in the overlaps (*b*, *d*, *f* and *h*) must be a multiple of 5.

Using this, can you find a lower and an upper bound for the possible ring totals?

Is there a solution for every ring total between the lower and upper bound?