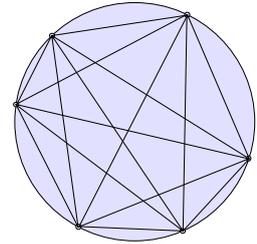


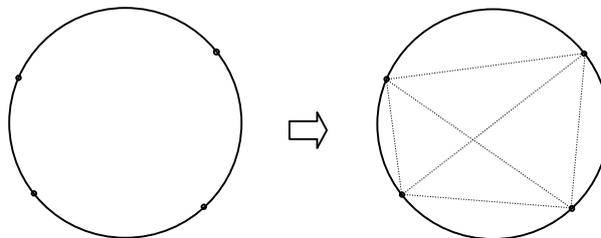
**intro**

This is an exercise which everyone should carry out at some time. Pupils know that an investigation often leads to a table of results – with of course a simple and straightforward pattern there to be found. Once they've seen a pattern, children are usually quite reluctant to test it out thoroughly. This investigation should be a warning to them . . .



**first steps**

Suppose you have a circle with a number of points marked around the circumference. By joining every point to every other point, you divide the circle up into a number of regions. A circle with 4 points marked, for example, will give you 8 regions :



**the investigation**

Get the pupils to join every point to every other point and then to count the number of regions for circles with 1, 2, 3, 4, 5 circumference points. It's absolutely essential to stop them at this stage – and then to ask them for their results. Put these up on the board for all to see and ask whether anyone can see a pattern and what the answer is going to be for the next circle. Most of the class will be keen to tell you that they've seen the pattern ie as the number of regions produced for these circles is 1, 2, 4, 8, 16, you're obviously just doubling as you go along – and so the next circle (the one with 6 points on the circumference) will obviously have 32 regions. Now let them draw in the lines for the last circle . . .

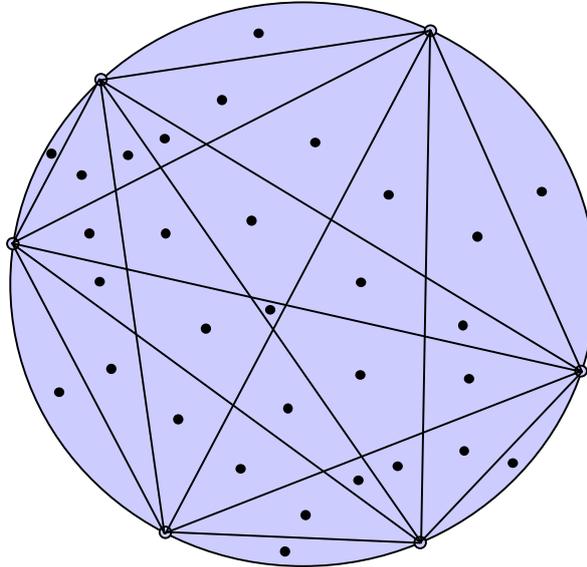
**practical**

Children will need to draw and count carefully. You can let them draw their own circles and put on the points but – the points must not be placed regularly around the circle or we begin to 'lose' regions (the idea being to look for the maximum number of regions we can obtain). A prepared gridsheet might be a better idea (see photocopy master).

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### results

Yes, the maximum number of regions you can obtain with 6 points really is 31. Many children will find their own predictions so compelling that they'll refuse to believe the answer isn't 32; you can get them to count again . . . and you can show them a finished drawing (see later).



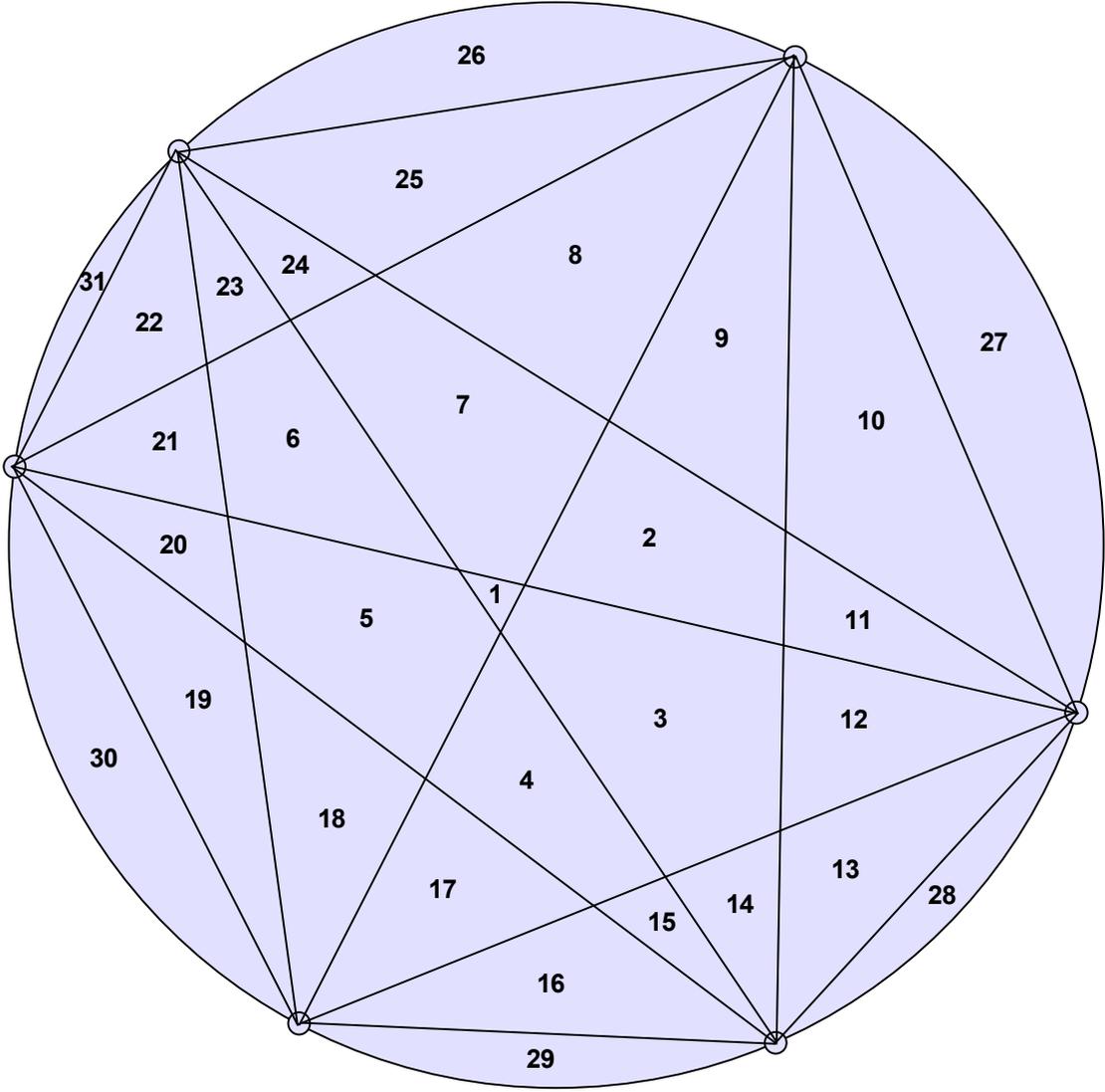
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### notes

The moral of the story is clearly that one shouldn't jump to conclusions. A few examples might well suggest a pattern to you but you do need to check out your ideas on quite a few cases to be really sure . . .

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regions in a circle



# regions in a circle

