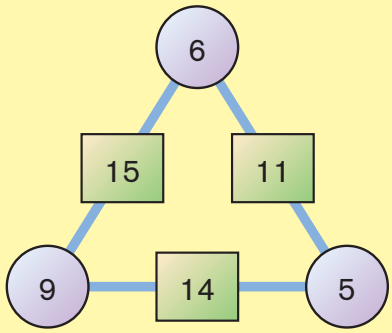
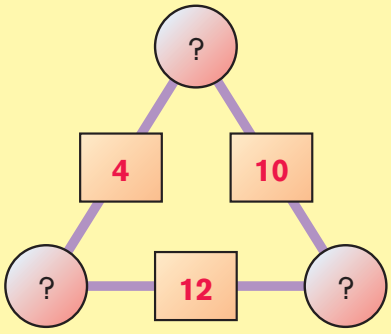
Arithmagons

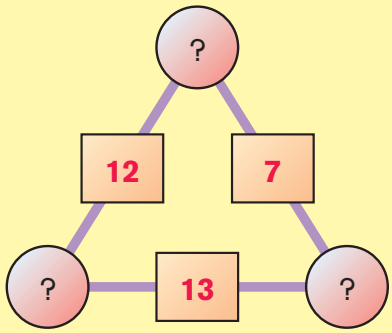
Generalising from number

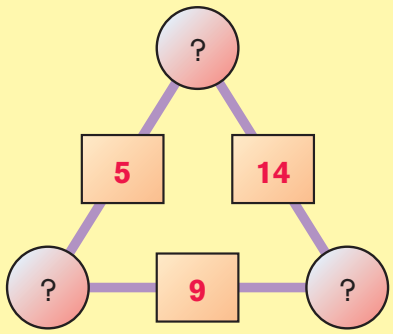
To find the middle number on the side of an arithmagon (in the square), add the vertex numbers (in the circles) either side of it.



Can you find the vertex numbers in the three arithmagons below?







Look carefully at your answers.

Have you any observations? Are there any patterns? Are there any rules?

Is there more than one answer (more than one set of numbers that can be written at the vertices) for any triangular arithmagon?

Make up some arithmagons of your own. Test out your predictions.

What strategies have you devised to help you work out your answers?

Can they help you with the following middle numbers?
272, 201, 127 4, 6, 11

Can you find the vertex numbers no matter what numbers are in the middle of the sides?

What about these middle numbers?
−8, −13, −11 8, 3, 2.5 −11, $8\frac{1}{2}$, 4

Have you found a simple strategy for working out all triangular arithmagons?

Did your previous patterns, observations and rules help you formulate this strategy?

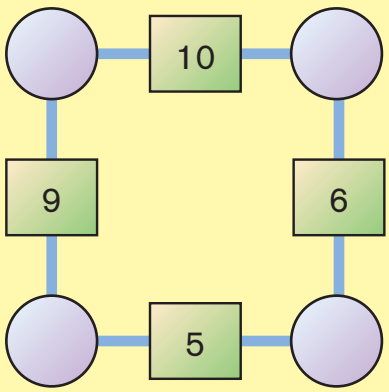
Does your strategy help you understand if and why all triangular arithmagons can be completed?

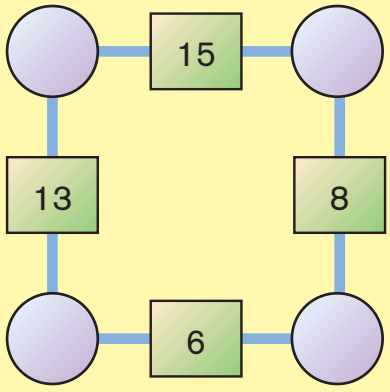
Square arithmagons

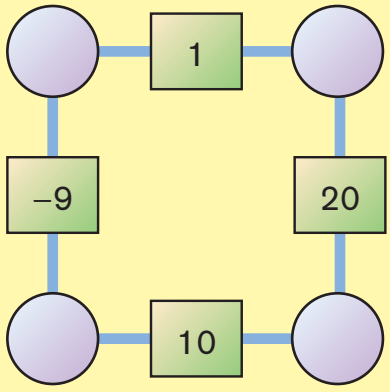
Generalising from number

The middle number on the side of an arithmagon is the sum of the two vertex numbers either side of it.

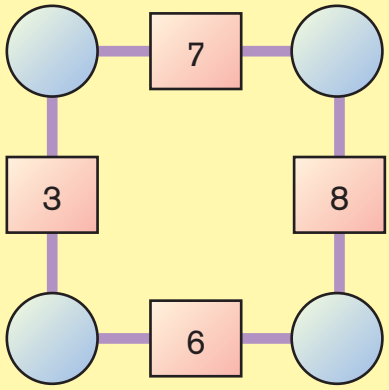
Can you find vertex numbers in the three arithmagons below?
Is there always just one answer?







Are square arithmagons always possible to construct? Try this one:

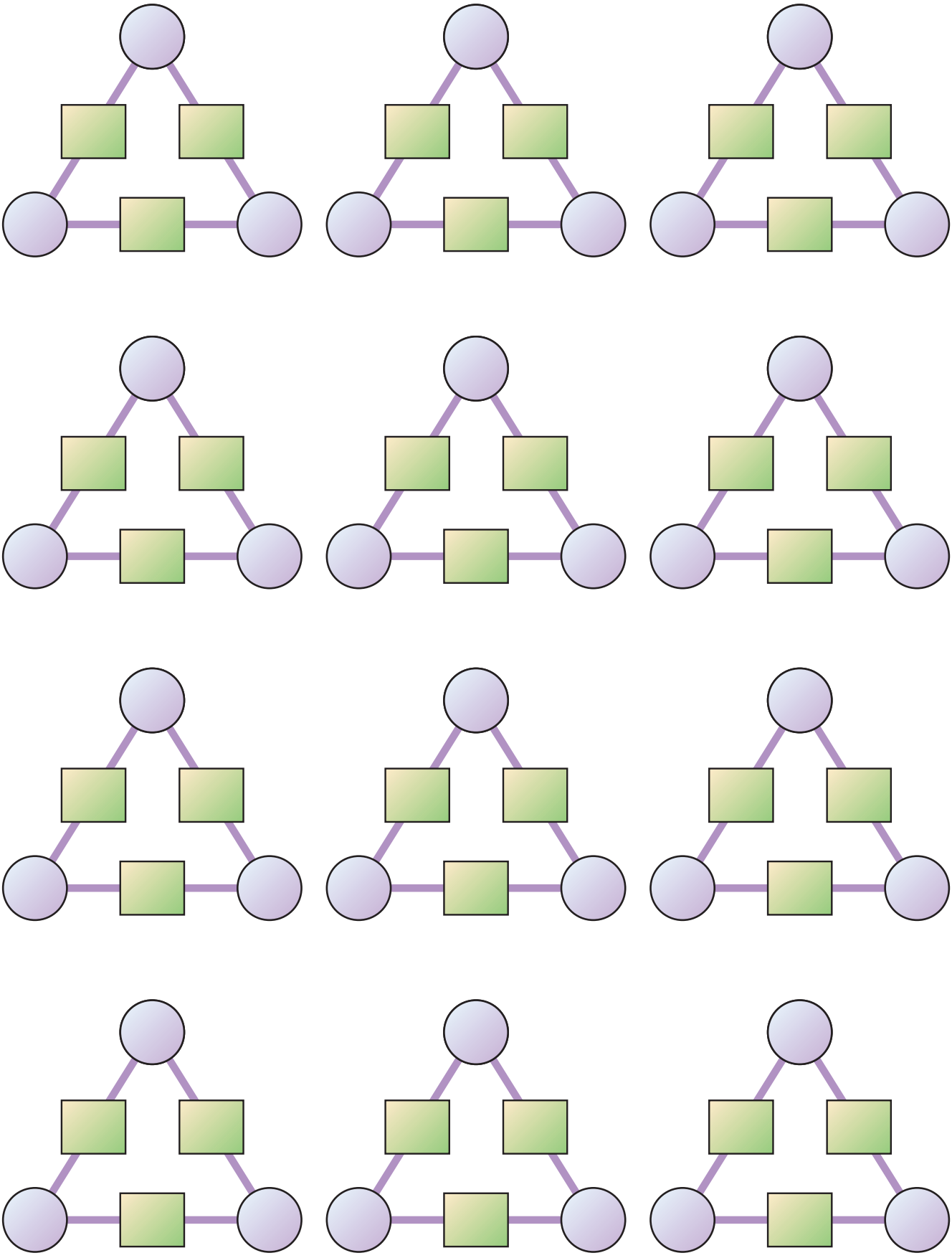


Can you find a general rule which will explain your findings?

What about looking at arithmagons with more sides?
Do they have anything in common with triangular or square arithmagons?

Arithmagons: blank grids

Resource sheet



Square arithmagons: blank grids

Resource sheet