



UK Maths Trust

Mentoring Scheme

Pythagoras

Sample questions

These questions are taken from the first sheet and give a good indication of the level of difficulty and prerequisite knowledge required at the start of the programme.

1. Pythagoras was born in the year 569 BCE (approximately). What is the 569th letter in the sequence

ABCDED CBABCDED CBABCDED CBAB...

where the pattern *ABCDED CB* is repeated again and again?

2. To make 'short' pastry one uses flour to fat (butter, margarine, etc.) in the ratio 2 : 1. To make 'flaky' pastry requires a ratio of 4 : 3.

I have 3 kg of flour and 2 kg of fat and wish to use all the ingredients to make some of each type of pastry. How much flaky pastry do I make?

3. You tell your friend that there is the same chance of obtaining an even number of heads when tossing four coins as of a head showing when tossing one coin.

Your friend does not believe you.

How can you convince your friend that you are correct?