

United Kingdom
Mathematics Trust

Mentoring Scheme

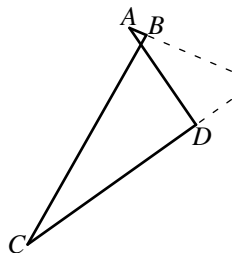
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ASSET MANAGEMENT

Hypatia

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. You are given that n is a positive integer with the property that when we add n and the sum of its digits, we obtain the number 313. What are the possible values of n ?
2. In the diagram AD and BC intersect at X . $\angle ABX = 90^\circ$. $\triangle ABX$ and $\triangle CDX$ are similar. $AB = 4$, $AX = 5$ and $AD = 20$. AB and CD extended intersect at Y but Y is not shown on the diagram. What is the area of $BXDY$?



3. A sequence of numbers of which the 1st is -5 and the 26th is $+2$ is defined by the rule that each number is the sum of the one before it and the one after it. Find the 12th number.