

Integers (Intermediate UKMT)

These questions must be attempted ***without a calculator***

Topics covered in the questions below may not necessarily be from the topic of the title.

1. What is the value of $4002 - 2004$?
A 2004 B 2002 C 2000 D 1998 E 1996

2. Four of these numbers can make two pairs so that each pair adds up to 98 765.
Which number is the odd one out?
A 37 373 B 45 678 C 53 087 D 61 392 E 70 082

3. Alice's room is furnished with three-legged stools and four-legged chairs. There are 17 legs in all (excluding Alice's!).
How many three-legged stools are there?
A 1 B 2 C 3 D 4 E 5

4. Suppose that e , i , n and t represent different positive whole numbers, $n + i + n + e = 9$, $t + e + n = 10$ and $i = 1$.
What is t ?
A 2 B 3 C 4 D 5 E 6

5. In Niatirb they use Cibara numerals. These are the same shape as normal Arabic numerals, but with the meanings in the opposite order. So "0" means "nine", "1" means "eight" and so on. But they write their numbers from left to right and use arithmetic symbols just as we do. So, for example, they use 62 for the number we write as 37.
How do the inhabitants of Niatirb write the answer to the sum which they write as $837 + 742$?
A 419 B 580 C 1579 D 5317 E 8420

6. Which of the following scores is it impossible to achieve in this challenge?
(Note that if two or more answers are given to a question then they are treated as one incorrect answer.)
A 126 B 127 C 128 D 129 E 130

7. Seventy pupils (37 boys and 33 girls) are divided into two groups, with forty pupils in Group I and thirty pupils in Group II.

How many more boys are there in Group I than there are girls in Group II?

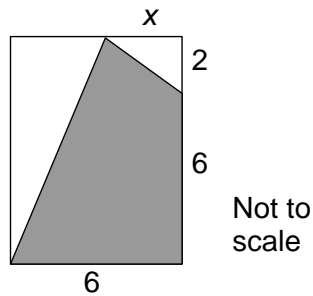
- A 4 B 7 C 8 D 9 E more information needed

8. What is the largest power of 2 that divides $127^2 - 1$?

- A 2^1 B 2^7 C 2^8 D 2^{63} E 2^{127}

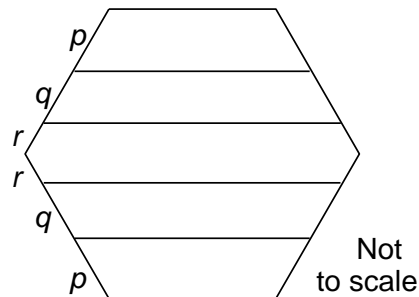
9. Three-quarters of the area of the rectangle has been shaded.

What is the value of x ?



- A 2 B 2.4 C 3 D 3.6 E 4

10. This regular hexagon has been divided into four trapezia and one hexagon. If each of the five sections has the same perimeter, what is the ratio of the lengths p , q and r ?



- A 8 : 2 : 1 B 12 : 4 : 1 C 9 : 3 : 1 D 6 : 3 : 1 E 9 : 4 : 1