

Indices (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. Which of these numbers is biggest?

- A 19×99 B 199×9 C 199^9 D $1^9 \times 9^9$ E 1^{999}

2. What is the value of $2^{10} - 10^2$?

- A -1000 B -80 C 0 D 924 E 1000

3. Gill is 18 this year. She and I went to a restaurant for lunch to celebrate her birthday. The bill for lunch for the two of us came to £25.50. Gill paid the bill by credit card and I left a £2.50 tip in cash. We agreed to split the total cost equally.

How much did I owe Gill?

- A £11 B £11.50 C £12 D £12.50 E £13

4. What is half of 2^{20} ?

- A 1^{10} B 1^{20} C 20 D 2^{10} E 2^{19}

5. Which of the following is the best estimate for the number of seconds which by February 1st 2001 had elapsed since the start of the year 2000?

- A 3×10^4 B 3×10^5 C 3×10^6 D 3×10^7 E 3×10^8

6. The Pythagoras Patisserie sells triangular cakes at 39p each and square buns at 23p each. For her party, Helen spent exactly £5.12 on an assortment of these cakes and buns.

How many items in total did she buy?

- A 15 B 16 C 17 D 18 E 19

7. What is the value of 2003^2 ?

- A 4009 B 400 009 C 401 209 D 4 000 009 E 4 012 009

8. Below are three statements. Exactly which ones are true?

- (i) 3^{10} is even (ii) 3^{10} is odd (iii) 3^{10} is square

- A (i) only B (ii) only C (iii) only D (i) and (iii) E (ii) and (iii)