

Rounding (Junior 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. Correct to one decimal place, what is the square root of 18?

A 2.6 B 3.0 C 3.6 D 4.2 E 9.0

2. The lightest seeds in the world are probably those of the Creeping Lady's-tresses Orchid, 500 000 of which would weigh 1 gram.

How many millions of these seeds weigh 1 kilogram?

A 2 B 200 C 500 D 5 000 E 1 000 000

3. At the first ever *World Worm-Charming Championship*, held at Wollaston, Cheshire in July 1980, Tom Shufflebottom charmed a record 510 worms out of his 3m × 3m patch of ground in 30 minutes.

If the worms, of average length 20cm, stopped wriggling and were laid out end to end round the edge of his patch, approximately how many times round would they stretch?

A $8\frac{1}{2}$ B 9 C 20 D 30 E 510

4. Each Junior Mathematical Challenge answer sheet weighs 6 grams. If 140 000 pupils enter the Challenge this year, what will be the total weight of all their answer sheets?

A 84 kg B 840 kg C 8 400 kg D 84 000 kg E 840 000 kg

5. An active sphagnum bog deposits a depth of about 1 metre of peat per 1000 years.

Roughly how many millimetres is that per day?

A 0.0003 B 0.003 C 0.03 D 0.3 E 3

6. On the island of Erewhon, all numbers are written with the digits in reverse order. For example, twelve is written 21. Su Erasmus, an inhabitant of Erewhon, was shown the subtraction $729 - 45$.

If no mistake was made, what answer did Su write down?

- A 684 B 486 C 279 D 873 E 378

7. It was reported recently that, in an average lifetime of 70 years, each human is likely to swallow about 8 spiders while sleeping. Supposing that the population of the UK is around 60 million, what is the best estimate of the number of unfortunate spiders consumed in this way in the UK each year?

- A 50 000 B 600 000 C 7 000 000 D 80 000 000 E 900 000 000

8. If I add up all the different prime factors of 1998, what answer would I get?

- A 42 B 43 C 48 D 116 E 1001

9. All except four of the nine numbers from 11 to 19 can be put in a single sequence "16, 18, 15, 12, 14" where each successive pair (such as 12 and 14, or 18 and 15) has highest common factor greater than 1.

If you make the longest possible sequence like this using as many as possible of the nine numbers from 111 to 119, how many numbers will be left out?

- A 0 B 1 C 2 D 3 E 4

10. Seven towns P, Q, S, T, U, V lie (in that order) along a road. The table below is meant to give all the distances between pairs of towns (in km): for example, the distance from P to S is 23 km. Unfortunately, fifteen of the distances are missing. How many of the missing distances can be calculated from the given information?

| | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|--|
| P | | | | | | | |
| ? | Q | | | | | | |
| ? | ? | R | | | | | |
| 23 | ? | ? | S | | | | |
| ? | 30 | ? | ? | T | | | |
| 58 | ? | 40 | ? | ? | U | | |
| ? | 68 | ? | 53 | ? | ? | V | |

- A 0 B 1 C 6 D 12 E 15