

Algebra & Sequences: Hard Practice Paper 8

Q1. The n th term of a sequence is $n^2 - 3n$. Which is the first term that is greater than 40?

- A. 40 B. 44 C. 48 D. 54 E. 70

Q2. Solve for x .

$$(x - 3) \div 4 = 5$$

- A. 8 B. 17 C. 20 D. 23 E. 32

Q3. Three cups of tea and two cakes cost £9.50 altogether. Three cups of tea and one cake cost £7.00. How much does one cup of tea cost?

- A. £1.00 B. £1.50 C. £2.00 D. £2.50 E. £3.00

Q4. If $m = -3$, what is the value of $2m^2 - m$?

- A. -21 B. 15 C. 18 D. 21 E. 27

Q5. k is a whole number. Which of these expressions is always a multiple of 3?

- A. $3k + 1$ B. $k + 3$ C. k^3 D. $2k + 3$ E. $3(k + 2)$

Q6. One sequence has n th term $5n + 2$ and another has n th term $3n + 20$. At which position do the two sequences have the same term?

- A. 6th B. 7th C. 8th D. 9th E. 10th

Q7. In a sequence each term is the sum of the two terms before it. The 1st term is 2 and the 4th term is 20. What is the 2nd term?

- A. 5 B. 7 C. 9 D. 11 E. 13

Q8. Simplify this expression.

$$3(4y - 2) - 2(5y - 7)$$

- A. $2y + 8$ B. $2y - 8$ C. $2y + 20$ D. $2y - 20$ E. $22y + 8$

Q9. The three angles of a triangle are x , $2x$ and $3x$. What is the size of the largest angle?

- A. 30° B. 60° C. 75° D. 90° E. 120°

Q10. The table shows the number of tiles in each pattern of a growing design. How many tiles will pattern 20 have?

Pattern	1	2	3	4
Tiles	8	13	18	23

- A. 98 B. 100 C. 103 D. 108 E. 113

Q11. x and y are whole numbers with $x + y = 12$ and $x - y = 4$. What is the value of xy ?

- A. 24 B. 28 C. 32 D. 36 E. 48

Q12. In 3 years' time Anna will be twice as old as she was 4 years ago. How old is she now?

- A. 9 B. 10 C. 11 D. 12 E. 14

Q13. Which of these numbers appears in both the sequence 4, 8, 12, 16, ... and the sequence 6, 12, 18, 24, ...?

- A. 18 B. 24 C. 30 D. 40 E. 54

Q14. A sequence goes up by the same amount each time. Its 4th term is 23 and its 9th term is 53. What is its n th term rule?

- A. $6n - 1$ B. $6n + 1$ C. $6n - 5$ D. $5n + 3$ E. $30 - 6n$

Q15. Pens cost 45p each and pencils cost 30p each. Jo buys 3 more pencils than pens and spends £3.90 altogether. How many pens does she buy?

- A. 2 B. 3 C. 4 D. 5 E. 6