Algebra & Sequences: Hard Practice Paper 6

Q1. What is the nth term rule for this sequence?

3, 6, 11, 18

A. $n^2 + 2$ *B.* $n^2 + 1$ *C.* $2n + 1$ *D.* $n^2 + n$ *E.* $3n$

Q2. Solve for x.

$(3x + 1) \div 2 = 8$

A. 4 *B.* 5 *C.* 6 *D.* 7 *E.* 11

Q3. Two cakes and three drinks cost £8.40 altogether. One cake and three drinks cost £5.70. How much does one cake cost?

A. £1.20 *B.* £1.50 *C.* £2.10 *D.* £2.70 *E.* £3.00

Q4. If $x = -5$, what is the value of $(x + 2)^2$?

A. −9 *B.* −6 *C.* 9 *D.* 23 *E.* 27

Q5. The sequence 5, 12, 19, 26, ... carries on in the same way. Which of these numbers could NOT be a term in it?

A. 61 *B.* 75 *C.* 89 *D.* 96 *E.* 100

Q6. The cost in pounds of hiring a hall is $C = 30 + 12h$, where h is the number of hours. Ravi paid £126. For how many hours did he hire the hall?

A. 6 *B.* 7 *C.* 8 *D.* 9 *E.* 10

Q7. In a sequence each term is the sum of the two terms before it. The 4th term is 17 and the 5th term is 28. What is the 2nd term?

A. 4 *B.* 5 *C.* 6 *D.* 7 *E.* 11

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Q8. Simplify this expression.

$$5(2a - 3) - 2(3a - 7)$$

A. 4a − 1 *B.* 4a + 1 *C.* 4a − 29 *D.* 4a − 22 *E.* 16a − 1

Q9. A rectangle has a length of (2x + 1) cm and a width of x cm. Its perimeter is 32 cm. What is its area?

A. 30 cm² *B.* 44 cm² *C.* 55 cm² *D.* 60 cm² *E.* 66 cm²

Q10. What is the next number in this sequence?

2, 5, 4, 10, 6, 15, 8, ?

A. 10 *B.* 12 *C.* 18 *D.* 20 *E.* 24

Q11. The table shows what a number machine does to each input. Which number must go in for 46 to come out?

Input	**2**	**5**	**7**	**10**
Output	7	16	22	31

A. 13 *B.* 14 *C.* 15 *D.* 16 *E.* 18

Q12. n is a whole number. Which of these expressions must always give an even number?

A. 2(n + 3) *B.* 2n + 1 *C.* n + 2 *D.* 3n *E.* n²

Q13. The nth triangular number is given by n(n + 1) ÷ 2. What is the 12th triangular number?

A. 66 *B.* 72 *C.* 78 *D.* 84 *E.* 91

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Q14. A sequence starts at 40 and the rule is "halve the term, then add 4". What is the 4th term?

A. 10 *B.* 12 *C.* 14 *D.* 16 *E.* 20

Q15. Sara has £8 more than Ben, and Tom has twice as much as Ben. Altogether the three of them have £48. How much does Ben have?

A. £8 *B.* £10 *C.* £12 *D.* £14 *E.* £16

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