FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

# A25: nth terms

*Solve problems by finding and using nth terms*

20 marks · 25 minutes · Non-calculator

**1)** Tile patterns use 5, 9, 13, . . . tiles. Which pattern uses 101 tiles?

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**[Question 1: 3 marks]**

**2)** Sequences $3n + 2$ and $52 - 2n$ have the same term in the same position. Find the position and the term.

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**[Question 2: 3 marks]**

**3)** Which is the first term of $2n^2 + 3n - 1$ to be greater than 1000?

.....

**[Question 3: 3 marks]**

**4)** Find an expression for the $n$th term of 3, 10, 21, 36, 55, . . .

. . . . . .

**[Question 4: 3 marks]**

**5)** Pattern $n$ has $n^2 + 2n$ dots. Which pattern has 168 dots?

. . . . . .

**[Question 5: 3 marks]**

**6)** A linear sequence has 3rd term 17 and 7th term 33. Find its *n*th term.

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**[Question 6: 3 marks]**

**7)** Row 1 of a theatre has 12 seats and each row has 2 more seats than the row before. How many seats are in the first 15 rows altogether?

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**[Question 7: 2 marks]**

**End of paper – 20 marks in total**

# Answers and brief mark scheme

| Q | Answer | Method / notes |
|---|---|---|
| 1 | 25 | $4n + 1$ (P1); $4n = 100$ (P1); A1. |
| 2 | 10th term, 32 | $3n + 2 = 52 - 2n$ (P1); $n = 10$ (P1); 32 (A1). |
| 3 | 22nd | $n = 21$ gives 944 (P1); $n = 22$ gives 1033 (P1); A1. |
| 4 | $2n^2 + n$ | Second difference 4 (P1); $2n^2$ (P1); A1. |
| 5 | 12 | $n^2 + 2n - 168 = 0$ (P1); $(n + 14)(n - 12)$ (P1); A1. |
| 6 | $4n + 5$ | $4d = 16$ (P1); $d = 4$ (P1); A1. |
| 7 | 390 | Last row 40 (P1); $15 \times \frac{12 + 40}{2}$ (A1). |