Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Patterns and sequences 1: Solutions**

Objective: To be able to find the general rule for a pattern/number sequence

**Step by step instructions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Position Number | 1 | 2 | 3 | 4 | 5 |
| Pattern |  |  |  |  |  |
| Terms | 4 | 7 | 10 | 13 | 16 |
| Working out | 3 | 6 | 9 | 12 | 15 |

1. In the box, draw the shape that is added on each time
2. Complete the missing pattern and terms
3. What do you add on each time? 3
(this is the term to term rule)
4. Which multiplication table has the same adding on pattern? 3
5. Fill in this multiplication table in the working out boxes
6. What do you need to do to make your working out boxes into the terms? Add 1
7. Use the information from (d) and (f) to form a general rule linking position number (N) and number of dots: 3N + 1
8. Use your rule to find the 100th term: 301

|  |
| --- |
| Write any revision hints, notes or reminders to yourself here: |

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Patterns and sequences 2**

Objective: To be able to find the general rule for a pattern/number sequence

**Structured question**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Position Number | 1 | 2 | 3 | 4 | 5 |
| Terms | 3 | 8 | 13 | 18 | 23 |
| Working out | 5 | 10 | 15 | 20 | 25 |

1. Complete the missing pattern and terms
2. What do you add on each time? 5
(this is the term to term rule)
3. Use part (b) to help fill in the multiplication table in the working out boxes
4. What do you need to do to make your working out boxes into the terms? Minus 2
5. Use the information from (b) and (e) to form a general rule linking position number (N) and number of dots: 5N - 2
6. What is the 100th term? 498

Use this structure to find the general rule (Nth term) for the following sequence:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Position Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Terms | 11 | 17 | 23 | 29 | 35 | 41 | 47 |
| Working out | 6 | 12 | 18 | 24 | 30 | 36 | 42 |

Rule: 6N+5

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Patterns and sequences 3**

Objective: To be able to find the general rule for a pattern/number sequence

**Structured question**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Position Number | 1 | 2 | 3 | 4 | 5 |
| Terms | 27 | 35 | 43 | 51 | 59 |
| Working out | 8 | 16 | 24 | 32 | 40 |

1. Complete the missing pattern and terms
2. What do you add on each time? 8 (this is the term to term rule)
3. Use part (b) to help fill in the multiplication table in the working out boxes
4. What is the general rule? 8N + 19
5. What is the 100th term? 819
6. Explain whether or not 87 is in this sequence:

8N + 19 = 87

8N = 68 and 8 isn’t a factor of 68, so not in the sequence

For the following questions:

1. Find the general rule (Nth term)

(ii) Find the 100th term

(ii) State whether 50 is in the sequence

1. 2, 15, 28, 41 … 13N – 11 1289 No
2. 112, 102, 92, 82, 72 … 122 - 10N -878 No
3. 5.9, 6.8, 7.7, 8.6, 9.5 … 0.9N + 5 95 Yes
4. -8, -1, 6, 13, 20 … 7N – 15 685 No