THIRD SPACE LEARNING

# GCSE Exam Questions

## Geometric Sequences | Algebra

# GCSE Exam Questions: Geometric Sequences

**1)** Which of these is a geometric progression? Circle your answer.

2, 4, 6, 8, 10 2, 3, 5, 7, 11

2, 8, 18, 32, 50 2, 4, 8, 16, 32

**(1 mark)**

**2)** The first four terms of a sequence are 3, 30, 300 and 3000.

**(a)** What is the tenth number in the sequence?

**(1)**

**(b)** What is the common ratio in this sequence?

**(2)**

**(3 marks)**

**3)** Match each example sequence with the type of sequence.

| |
|---|
| Triangular |
| Geometric |
| Arithmetic |
| Fibonacci |
| Quadratic |

| |
|---|
| 4, 4, 8, 12, 20,... |
| 1, 3, 6, 10, 15,... |
| 2, 8, 18, 32, 50,... |
| 3, 9, 27, 81, 243,... |
| -4, -7, -10, -13, -16,... |

**(3 marks)**

# GCSE Exam Questions: Geometric Sequences

**4)** Calculate the next term in the sequence:

0.02, 0.12, 0.72, …

**(2 marks)**

**5)** The common ratio of a sequence is $\sqrt{5}$. Complete the table for the first 6 terms of the sequence.

| $n$ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Term Value | | | | 25 | | |

**(3 marks)**

**3)** A chessboard has 64 squares labelled *A1*-*H8*.

See the diagram below.

**(a)** A grain of rice is placed on each square, such that one grain is placed on *A1,* two on *A2*, four on the *A3*, and so on (doubling the number of grains on each subsequent square). How many grains of rice would be on the final square, *H8*? Express your answer as a power of 2.

**(1 mark)**

# GCSE Exam Questions: Geometric Sequences

**(b)** What kind of sequence is this?

**(1)**

**(Total number of marks)**

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**7)** Josh says 6, 12, 15, 30, 35, 70 is a geometric progression.

Sofia says 4, 12, 36, 108, 324, 972 is a geometric progression.

Who is correct? Give a reason

- ☐ Josh
- ☐ Sofia
- ☐ They are both correct
- ☐ They are both incorrect

**(2 marks)**

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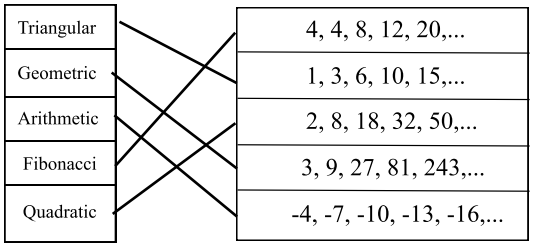
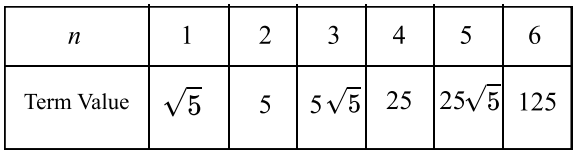
**8)** Calculate the sum of the first 5 terms of the sequence:

$n^{th}$ term = $\left(\frac{1}{2}\right)^{n-1}$

**(4 marks)**

# GCSE Exam Questions: Geometric Sequences Answers

| | Question | Answer | Marks |
|---|---|---|---|
| **1)** | Which of these is a geometric progression? Circle your answer.<br>2,4,6,8,10 2,3,5,7,11<br>2, 8, 18, 32, 50 2, 4, 8, 16, 32 | 2, 4, 8, 16, 32 | **(1)** |
| **2)** | The first four terms of a sequence are 3, 30, 300 and 3000. | | |
| **(a)** | What is the tenth number in the sequence? | 3,000,000,000 | **(1)** |
| **(b)** | What is the common ratio in this sequence? | 30 ÷ 3<br>10 | **(1)**<br>**(1)** |
| **3)** | Match each example sequence with the type of sequence. |  <br>Minimum 2 correct<br>Minimum 3 correct<br>All 5 sequences correct | <br>**(1)**<br>**(1)**<br>**(1)** |
| **4)** | Calculate the next term in the sequence:<br>0.02, 0.12, 0.72, … | $r = 6$<br>4.32 | **(1)**<br>**(1)** |
| **5)** | The common ratio of a sequence is $\sqrt{5}$.<br>Complete the table for the first 6 terms of the sequence. |  <br>Minimum 2 correct<br>Minimum 4 correct<br>All 5 values correct | <br>**(1)**<br>**(1)**<br>**(1)** |

# GCSE Exam Questions: Geometric Sequences Answers

| | Question | Answer | Marks |
|---|---|---|---|
| **6)** **(a)** | A chessboard has 64 squares labelled *A1-H8*.<br><br>A grain of rice is placed on each square, such that one grain is placed on *A1*, two on *A2*, four on the *A3*, and so on (doubling the number of grains on each subsequent square). How many grains of rice would be on the final square, *H8*? Express your answer as a power of 2. |  <br>$2^{63}$ or $2^{64-1}$ | **(1)** |
| **(b)** | What kind of sequence is this? | Geometric | **(1)** |
| **7)** | Josh says 6, 12, 15, 30, 35, 70 is a geometric progression.<br>Sofia says 4, 12, 36, 108, 324,972 is a geometric progression | Sofia is correct.<br><br>The common ratio is 3 for each progression between terms for Sofia's sequence. | **(1)**<br><br>**(1)** |
| **8)** | Calculate the sum of the first 5 terms of the sequence : $n^{th}$ term $= (\frac{1}{2})^{n-1}$ | Finding the $1^{st}$ term = 1<br>Finding the first 5 terms<br>$= 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$<br>$= 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16}$<br>Adding the first 5 terms together<br>$\frac{31}{16} = 1\frac{15}{16}$ | **(1)**<br><br>**(1)**<br><br>**(1)**<br><br>**(1)** |

# Where to go next?

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