Name:

Exam Style Questions

Geometric Progressions

Corbettmaths

Equipment needed: Pen and Calculator

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 375

Answers and Video Solutions

1. Here are the first five terms of a sequence

1 4 16 64 256

(a) Work out the next term in the sequence

256 × 4 = 1024

1024

(1)

(b) Explain how you worked out the answer to part (a).

The common ratio is 4 (4 ÷ 1 = 4, 16 ÷ 4 = 4 etc)

So 256 × 4 = 1024.

(1)

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2. The first two terms of a geometric progression are 5 and 15

Work out the next term.

×3 ×3
5, 15, 45

15 ÷ 5 = 3

15 × 3

45

(1)

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3. A geometric progression begins 2, 10, ...

Work out the next three terms.

×5 ×5 ×5 ×5
2, 10, 50, 250, 1250

50, 250, 1250

(2)

4. Which of the following is a geometric progression?

Circle the correct answer.

+3 +3 +3
5 8 11 14 ✗

5+6=11
6+11=17
5 6 11 17 ✗

×2 ×2 ×2
5 10 20 40 ✓

+2 +4 +6
5 7 11 17 ✗

(1)

5. Which of the following is a geometric progression?

Circle the correct answer.

+2 +2 +2
2 4 6 8 ✗

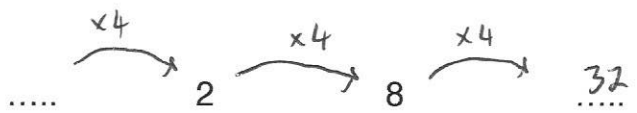
2+3=5
3+5=8
+1 +2 +3
2 3 5 8 ✗

2 4 6 10 ✗
+2 +4 = 6
6 + 4 = 10

×2 ×2 ×2
2 4 8 16 ✓

(1)

6. The second and third terms of a geometric progression are shown.



Work out the first and the fourth terms of the progression.

2 ÷ 4 = 0.5

First term 0.5

Fourth term 32

(2)

7. The first two terms of a geometric progression are shown.

60 $\xrightarrow{\times \frac{1}{5}}$ 12 $\xrightarrow{\times \frac{1}{5}}$ .....

Work out the third term of the progression.

$12 \times \frac{1}{5} = \frac{12}{5}$

or $12 \div 5 = 2.4$ $\quad 5\overline{)12.0}\ 2.4$

2.4 or $\frac{12}{5}$

(1)

8. The first three terms of a geometric progression are shown.

$\frac{4}{5}$ $\xrightarrow{\times \frac{3}{7}}$ $\frac{12}{35}$ $\xrightarrow{\times \frac{3}{7}}$ $\frac{36}{245}$

Work out the fourth term of the progression.

$\frac{12}{35} \div \frac{4}{5} = \frac{3}{7}$

or $\frac{36}{245} \div \frac{12}{35} = \frac{3}{7}$

$\frac{36}{245} \times \frac{3}{7} = \frac{108}{1715}$

$\frac{108}{1715}$

(1)

9. The first and third terms of a geometric progression are shown.
All the terms in the progression are positive.

3 $\xrightarrow{\times y}$ ... (12) $\xrightarrow{\times y}$ 48 $\xrightarrow{\times 4}$ ..... (192)

Work out the fourth term of the progression.

$3 \times y \times y = 48$

$y \times y = 16$

$y = 4$

$48 \times 4 = 192$

192

(2)

10. The second and fourth terms of a geometric progression are shown.
All the terms in the progression are negative.

$-\frac{2}{3}$ ..... –2 ..... -6 ..... –18

×y ×y

Work out the first of the progression.

$-2 \times y \times y = -18$

$y \times y = 9$

$y = 3$

$-2 \div 3 = -\frac{2}{3}$

$-\frac{2}{3}$

.....

(2)

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11. The first two terms of a geometric sequence are 3 and 12.

Find the sum of the first 5 terms of the geometric sequence.

×4 ×4 ×4 ×4

3, 12, 48, 192, 768

$3 + 12 + 48 + 192 + 768 = 1023$

1023

.....

(3)

12. The fifth term of a geometric sequence is 3072
The sixth term of the geometric sequence is 24576

Find the first term of the geometric sequence.

$24576 \div 3072 = 8$

1st	2nd	3rd	4th	5th	6th
0.75	6	48	384	3072	24576

3/4

(3)

13. The ninth term of a geometric progression is double the tenth term.

The first term of the geometric progression is 300

Find the third term of the geometric progression.

9th → 10th (×1/2)

$300 \times \frac{1}{2} = 150$

$150 \times \frac{1}{2} = 75$

75

(2)

14. A is an arithmetic progression.
The nth term of A is $9n - 3$

B is a geometric progression.
The first three terms of B are: 3 6 12

The 43rd term of A is the xth term of B.

Find x.

A: $9n - 3$

$9 \times 43 - 3 = 384$

B:

1st	2nd	3rd	4th	5th	6th	7th	8th
3	6	12	24	48	96	192	384

8

.....

(4)

15. The second term of a geometric progression is 48
The sixth term of the same progression is 12288

Find the fifth term.

1st	2nd	3rd	4th	5th	6th
	48				12288

$\xrightarrow{\times y}$ $\xrightarrow{\times y}$ $\xrightarrow{\times y}$ $\xrightarrow{\times y}$

$12288 \div 4 = 3072$

$48y^4 = 12888$

$y^4 = 256$

$y = 4$

3072

.....

(3)

16. Here are the first four terms of a sequence.

$$2 \xrightarrow{\times\sqrt{7}} 2\sqrt{7} \xrightarrow{\times\sqrt{7}} 14 \xrightarrow{\times\sqrt{7}} 14\sqrt{7}$$

Work out the fifth term of the sequence.

$14\sqrt{7} \times \sqrt{7}$

$= 14\sqrt{49}$

$= 14 \times 7$

$= 98$

98

(2)

17. Here are the first three terms of a sequence.

$$6\sqrt{3} \xrightarrow{\times\sqrt{3}} 18 \xrightarrow{\times\sqrt{3}} 18\sqrt{3}$$

Work out the fourth term of the sequence.

$18\sqrt{3} \times \sqrt{3}$

$= 18\sqrt{9}$

$= 18 \times 3$

$= 54$

54

(2)

18. Here are the first four terms of a sequence.

$\sqrt{3}$ $\quad$ 6 $\xrightarrow{\times 2\sqrt{3}}$ $12\sqrt{3}$ $\quad$ 72 $\xrightarrow{\times 2\sqrt{3}}$

Work out the next term of the sequence.

$12\sqrt{3} \div 6 = 2\sqrt{3}$

$72 \times 2\sqrt{3} = 144\sqrt{3}$

$144\sqrt{3}$

.....

(2)

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19. S is a geometric sequence.

The first three terms of S are $(x - 15)$, x and $(3x + 20)$, where x is positive.

Find the value of x.

$\frac{x}{x-15} = \frac{3x+20}{x}$

$x^2 = (3x + 20)(x - 15)$

$x^2 = 3x^2 - 45x + 20x - 300$

$0 = 2x^2 - 25x - 300$

$0 = (2x + 15)(x - 20)$

$x = -\frac{15}{2}$ or $x = 20$

20

.....

(5)

20. S is a geometric sequence.

The first three terms of S are $(x + 18)$, x and $(2x - 15)$, where x is positive.

Find the value of x.

$\frac{x}{x+18} = \frac{2x-15}{x}$

$x^2 = (2x - 15)(x + 18)$

$x^2 = 2x^2 + 36x - 15x - 270$

$0 = x^2 + 21x - 270$

$0 = (x + 30)(x - 9)$

$x = -30$ $x = 9$

x

9

.....

(5)