

1.4 Solutions

A-Level Pure Mathematics, Year 2 Geometric Progressions



The difference between successive terms is not constant

[1 mark]



$$G_n = ar^{n-1}$$

[1 mark]

1.4.1 Solution to 1.2 Example (Teaching Video)

$$\begin{aligned} \text{(i)} \quad \frac{ar^4}{ar} &= \frac{567}{21} \\ r^3 &= 27 \\ r &= 3 \end{aligned}$$

[3 marks]

$$\text{(ii)} \quad 7, 21, 63, 189, 567, 1701, \dots$$

[2 marks]

$$\begin{aligned} \text{(iii)} \quad ar^{19} &= 7 \times 3^{19} \\ &= 8\,135\,830\,269 \end{aligned}$$

[2 marks]

1.4.2 Solutions to Exercise 1.3

Answer 1

8, 12, 18, 27, 40.5, ...

[2 marks]

Answer 2

8, 4, 2, 1, 0.5, ...

[2 marks]

Answer 3

3, -6, 12, -24, 48, ...

[2 marks]

Answer 4

$$\text{(i)} \quad a = 0.3, \quad r = 0.1 \qquad \text{(ii)} \quad \frac{1}{3}$$

[2, 2 marks]

Answer 5

5 811 307 335

[3 marks]

Answer 6

$$\begin{aligned} \text{(i)} \quad &5 \\ \text{(ii)} \quad &6, 30, 150, 750, 3750, 18750, \dots \\ \text{(iii)} \quad &292\,968\,750 \end{aligned}$$

[3, 2, 2 marks]

Answer 7

- (i) $- 0.5$
 (ii) $- 12, 6, - 3, 1.5, - 0.75, 0.375$
 (iii) $\frac{3}{131072}$

[3, 2, 2 marks]

Answer 8

- (i) AP (ii) neither (iii) GP
 (iv) GP (v) GP

[5 marks]

Answer 9

120

Answer 10

186

[3, 3 marks]

Answer 11

- (i) $\pm 3 \sqrt{3}$ (ii) $\pm 9 \sqrt{3}$

[3, 2 marks]

Answer 12

- (i) 1.1
 (ii) 1.1, 1.21, 1.331, 1.4641, 1.61051, 1.771561
 (iii) $\sum_{1}^{40} 1.1^n$

[3, 2, 2 marks]

Answer 13 ± 0.125

[4 marks]

Answer 14

- (i) $\frac{x^2}{2x} = \frac{2x}{8 - x}$
 $x^2 (8 - x) = 2x \times 2x$
 $8x^2 - x^3 = 4x^2$
 $0 = x^3 - 4x^2 \quad \square$
 $x^2 (x - 4) = 0$
 $\therefore x = 4, \text{ as told } x > 0$

- (ii) 2 097 152

- (iii) Yes, as 4096 is the 11th term.

[2, 3, 1 marks]

This document is a part of a **Mathematics Community Outreach Project** initiated by Shrewsbury School

It may be freely duplicated and distributed, unaltered, for non-profit educational use

In October 2020, Shrewsbury School was voted "**Independent School of the Year 2020**"

© 2025 Number Wonder

Teachers may obtain detailed worked solutions to the exercises by email from MHHShrewsbury@Gmail.com