Geometric Mean – Day 3

Unit 7: Representations of Exponential Relations

Find the missing term or terms in each geometric sequence.

1. …, 3, ___, 108, … $a_2 = 18$	2. …, −1, ___, −16, … $a_2 = -4$
3. …, −4, ___, ___, −500, … $a_2 = -20$ $a_3 = -100$	4. …, −4, ___, ___, −108, … $a_2 = -12$ $a_3 = -36$
5. …, 3, ___, ___, 192, … $a_2 = 12$ $a_3 = 48$	6. …, 1, ___, ___, 8, … $a_2 = 2$ $a_3 = 4$
7. …, 3, ___, ___, ___, 3888, … $a_2 = 18$ $a_3 = 108$ $a_4 = 648$	8. …, 3, ___, ___, ___, 48, … $a_2 = 6$ $a_3 = 12$ $a_4 = 24$
9. …, 4, ___, ___, ___, 1024, … $a_2 = 16$ $a_3 = 64$ $a_4 = 256$	10. …, 4, ___, ___, ___, 64, … $a_2 = 8$ $a_3 = 16$ $a_4 = 32$

11. …, −4, ___, ___, ___, −2500, …

$a_2 = -20$

$a_3 = -100$

$a_4 = -500$

12. …, 2, ___, ___, ___, 1250, …

$a_2 = 10$

$a_3 = 50$

$a_4 = 250$

13. …, 1, ___, ___, ___, ___, 3125, …

$a_2 = 5$

$a_3 = 25$

$a_4 = 125$

$a_5 = 625$

14. …, 1, ___, ___, ___, ___, 1024, …

$a_2 = 4$

$a_3 = 16$

$a_4 = 64$

$a_5 = 256$

15. …, −3, ___, ___, ___, ___, −23328, …

$a_2 = -18$

$a_3 = -108$

$a_4 = -648$

$a_5 = -3888$

16. …, 2, ___, ___, ___, ___, 2048, …

$a_2 = 8$

$a_3 = 32$

$a_4 = 128$

$a_5 = 512$

17. …, 3, ___, ___, ___, ___, ___, 139968, …

$a_2 = 18$

$a_3 = 108$

$a_4 = 648$

$a_5 = 3888$

$a_6 = 23328$

18. …, −1, ___, ___, ___, ___, ___, −15625, …

$a_2 = -5$

$a_3 = -25$

$a_4 = -125$

$a_5 = -625$

$a_6 = -3125$

19. …, −4, ___, ___, ___, ___, ___, −62500, …

$a_2 = -20$

$a_3 = -100$

$a_4 = -500$

$a_5 = -2500$

$a_6 = -12500$

20. …, 4, ___, ___, ___, ___, ___, 2916, …

$a_2 = 12$

$a_3 = 36$

$a_4 = 108$

$a_5 = 324$

$a_6 = 972$

① …, 3, —, 108, …
a_1 a_2 a_3

$a_2 = 3 \cdot 6 = \boxed{18}$

$a_n = a_1 (r)^{n-1}$

$108 = 3(r)^{3-1}$

$\frac{108}{3} = \frac{3(r)^2}{3}$

$\sqrt{36} = \sqrt{r^2}$

$6 = r$

---

② …, −1, —, −16, …
a_1 a_2 a_3

$a_2 = -1 \cdot 4 = \boxed{-4}$

$a_n = a_1 (r)^{n-1}$

$-16 = -1(r)^{3-1}$

$\frac{-16}{-1} = \frac{-1(r)^2}{-1}$

$\sqrt{16} = \sqrt{r^2}$

$4 = r$

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③ …, −4, —, —, −500, …
a_1 a_2 a_3 a_4

$a_2 = -4 \cdot 5 = \boxed{-20}$

$a_3 = -20 \cdot 5 = \boxed{-100}$

$a_n = a_1 (r)^{n-1}$

$-500 = -4(r)^{4-1}$

$\frac{-500}{-4} = \frac{-4(r)^3}{-4}$

$\sqrt[3]{125} = \sqrt[3]{r^3}$

$5 = r$

---

④ …, −4, —, —, −108, …
a_1 a_2 a_3 a_4

$a_2 = -4 \cdot 3 = \boxed{-12}$

$a_3 = -12 \cdot 3 = \boxed{-36}$

$a_n = a_1 (r)^{n-1}$

$-108 = -4(r)^{4-1}$

$\frac{-108}{-4} = \frac{-4(r)^3}{-4}$

$\sqrt[3]{27} = \sqrt[3]{r^3}$

$3 = r$

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⑤ …, 3, —, —, 192, …
a_1 a_2 a_3 a_4

$a_2 = 3 \cdot 4 = \boxed{12}$

$a_3 = 12 \cdot 4 = \boxed{48}$

$a_n = a_1 (r)^{n-1}$

$192 = 3(r)^{4-1}$

$\frac{192}{3} = \frac{3(r)^3}{3}$

$\sqrt[3]{64} = \sqrt[3]{r^3}$

$4 = r$

⑥ …, 1, —, —, 8, …
a_1 a_2 a_3 a_4

$a_2 = 1 \cdot 2 = \boxed{2}$

$a_3 = 2 \cdot 2 = \boxed{4}$

$a_n = a_1 (r)^{n-1}$

$8 = 1(r)^{4-1}$

$\frac{8}{1} = \frac{1(r)^3}{1}$

$\sqrt[3]{8} = \sqrt[3]{r^3}$

$2 = r$

---

⑦ …, 3, —, —, —, 3888, …
a_1 a_2 a_3 a_4 a_5

$a_2 = 3 \cdot 6 = \boxed{18}$

$a_3 = 18 \cdot 6 = \boxed{108}$

$a_4 = 108 \cdot 6 = \boxed{648}$

$a_n = a_1 (r)^{n-1}$

$3888 = 3(r)^{5-1}$

$\frac{3888}{3} = \frac{3(r)^4}{3}$

$\sqrt[4]{1296} = \sqrt[4]{r^4}$

$6 = r$

---

⑧ …, 3, —, —, —, 48, …
a_1 a_2 a_3 a_4 a_5

$a_2 = 3 \cdot 2 = \boxed{6}$

$a_3 = 6 \cdot 2 = \boxed{12}$

$a_4 = 12 \cdot 2 = \boxed{24}$

$a_n = a_1 (r)^{n-1}$

$48 = 3(r)^{5-1}$

$\frac{48}{3} = \frac{3(r)^4}{3}$

$\sqrt[4]{16} = \sqrt[4]{r^4}$

$2 = r$

---

⑨ …, 4, —, —, —, 1024, …
a_1 a_2 a_3 a_4 a_5

$a_2 = 4 \cdot 4 = \boxed{16}$

$a_3 = 16 \cdot 4 = \boxed{64}$

$a_4 = 64 \cdot 4 = \boxed{256}$

$a_n = a_1 (r)^{n-1}$

$1024 = 4(r)^{5-1}$

$\frac{1024}{4} = \frac{4(r)^4}{4}$

$\sqrt[4]{256} = \sqrt[4]{r^4}$

$4 = r$

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⑩ …, 4, —, —, —, 64, …
a_1 a_2 a_3 a_4 a_5

$a_2 = 4 \cdot 2 = \boxed{8}$

$a_3 = 8 \cdot 2 = \boxed{16}$

$a_4 = 16 \cdot 2 = \boxed{32}$

$a_n = a_1 (r)^{n-1}$

$64 = 4(r)^{5-1}$

$\frac{64}{4} = \frac{4(r)^4}{4}$

$\sqrt[4]{16} = \sqrt[4]{r^4}$

$2 = r$

(11) $\ldots, \underset{a_1}{-4}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{-2500}, \ldots$

$a_2 = -4 \cdot 5 = \boxed{-20}$

$a_3 = -20 \cdot 5 = \boxed{-100}$

$a_4 = -100 \cdot 5 = \boxed{-500}$

$a_n = a_1 (r)^{n-1}$

$-2500 = -4(r)^{5-1}$

$\frac{-2500}{-4} = \frac{-4(r)^4}{-4}$

$\sqrt[4]{625} = \sqrt[4]{r^4}$

$5 = r$

---

(12) $\ldots, \underset{a_1}{2}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{1250}, \ldots$

$a_2 = 2 \cdot 5 = \boxed{10}$

$a_3 = 10 \cdot 5 = \boxed{50}$

$a_4 = 50 \cdot 5 = \boxed{250}$

$a_n = a_1 (r)^{n-1}$

$1250 = 2(r)^{5-1}$

$\frac{1250}{2} = \frac{2(r)^4}{2}$

$\sqrt[4]{625} = \sqrt[4]{r^4}$

$5 = r$

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(13) $\ldots, \underset{a_1}{1}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{3125}, \ldots$

$a_2 = 1 \cdot 5 = \boxed{5}$ $\quad a_4 = 25 \cdot 5 = \boxed{125}$

$a_3 = 5 \cdot 5 = \boxed{25}$ $\quad a_5 = 125 \cdot 5 = \boxed{625}$

$a_n = a_1 (r)^{n-1}$

$3125 = 1(r)^{6-1}$

$\frac{3125}{1} = \frac{1(r)^5}{1}$

$\sqrt[5]{3125} = \sqrt[5]{r^5}$

$5 = r$

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(14) $\ldots, \underset{a_1}{1}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{1024}, \ldots$

$a_2 = 1 \cdot 4 = \boxed{4}$ $\quad a_4 = 16 \cdot 4 = \boxed{64}$

$a_3 = 4 \cdot 4 = \boxed{16}$ $\quad a_5 = 64 \cdot 4 = \boxed{256}$

$a_n = a_1 (r)^{n-1}$

$1024 = 1(r)^{6-1}$

$\frac{1024}{1} = \frac{1(r)^5}{1}$

$\sqrt[5]{1024} = \sqrt[5]{r^5}$

$4 = r$

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(15) $\ldots, \underset{a_1}{-3}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{-23328}, \ldots$

$a_2 = -3 \cdot 6 = \boxed{-18}$ $\quad a_4 = -108 \cdot 6 = \boxed{-648}$

$a_3 = -18 \cdot 6 = \boxed{-108}$ $\quad a_5 = -648 \cdot 6 = \boxed{-3888}$

$a_n = a_1 (r)^{n-1}$

$-23328 = -3(r)^{6-1}$

$\frac{-23328}{-3} = \frac{-3(r)^5}{-3}$

$\sqrt[5]{7776} = \sqrt[5]{r^5}$

$6 = r$

(16) $\ldots, \underset{a_1}{2}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{2048}, \ldots$

$a_2 = 2 \cdot 4 = \boxed{8}$

$a_3 = 8 \cdot 4 = \boxed{32}$

$a_4 = 32 \cdot 4 = \boxed{128}$

$a_4 = 128 \cdot 4 = \boxed{512}$

$a_n = a_1 (r)^{n-1}$

$2048 = 2 (r)^{6-1}$

$\frac{2048}{2} = \frac{2(r)^5}{2}$

$\sqrt[5]{1024} = \sqrt[5]{r^5}$

$4 = r$

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(17) $\ldots, \underset{a_1}{3}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{\_\_}, \underset{a_7}{139968}, \ldots$

$a_2 = 3 \cdot 6 = \boxed{18}$

$a_3 = 18 \cdot 6 = \boxed{108}$

$a_4 = 108 \cdot 6 = \boxed{648}$

$a_5 = 648 \cdot 6 = \boxed{3888}$

$a_6 = 3888 \cdot 6 = \boxed{23328}$

$a_n = a_1 (r)^{n-1}$

$139968 = 3(r)^{7-1}$

$\frac{139968}{3} = \frac{3(r)^6}{3}$

$\sqrt[6]{46656} = \sqrt[6]{r^6}$

$6 = r$

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(18) $\ldots, \underset{a_1}{-1}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{\_\_}, \underset{a_7}{-15625}, \ldots$

$a_2 = -1 \cdot 5 = \boxed{-5}$

$a_3 = -5 \cdot 5 = \boxed{-25}$

$a_4 = -25 \cdot 5 = \boxed{-125}$

$a_5 = -125 \cdot 5 = \boxed{-625}$

$a_6 = -625 \cdot 5 = \boxed{-3125}$

$a_n = a_1 (r)^{n-1}$

$-15625 = -1(r)^{7-1}$

$\frac{-15625}{-1} = \frac{-1(r)^6}{-1}$

$\sqrt[6]{15625} = \sqrt[6]{r^6}$

$5 = r$

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(19) $\ldots, \underset{a_1}{-4}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{\_\_}, \underset{a_7}{-62500}, \ldots$

$a_2 = -4 \cdot 5 = \boxed{-20}$

$a_3 = -20 \cdot 5 = \boxed{-100}$

$a_4 = -100 \cdot 5 = \boxed{-500}$

$a_5 = -500 \cdot 5 = \boxed{-2500}$

$a_6 = -2500 \cdot 5 = \boxed{-12500}$

$a_n = a_1 (r)^{n-1}$

$-62500 = -4(r)^{7-1}$

$\frac{-62500}{-4} = \frac{-4(r)^6}{-4}$

$\sqrt[6]{15625} = \sqrt[6]{r^6}$

$5 = r$

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(20) $\ldots, \underset{a_1}{4}, \underset{a_2}{\_\_}, \underset{a_3}{\_\_}, \underset{a_4}{\_\_}, \underset{a_5}{\_\_}, \underset{a_6}{\_\_}, \underset{a_7}{2916}, \ldots$

$a_2 = 4 \cdot 3 = \boxed{12}$

$a_3 = 12 \cdot 3 = \boxed{36}$

$a_4 = 36 \cdot 3 = \boxed{108}$

$a_5 = 108 \cdot 3 = \boxed{324}$

$a_6 = 324 \cdot 3 = \boxed{972}$

$a_n = a_1 (r)^{n-1}$

$2916 = 4(r)^{7-1}$

$\frac{2916}{4} = \frac{4(r)^6}{4}$

$\sqrt[6]{729} = \sqrt[6]{r^6}$

$3 = r$