

Geometric Mean
Unit 7: Representations of Exponential Relations

Find the missing term or terms in each geometric sequence.

1. ..., -4, ____, -144, ...

$$a_2 = -24$$

2. ..., 4, ____, 100, ...

$$a_2 = 20$$

3. ..., 1, ____, ____, 125, ...

$$a_2 = 5$$

$$a_3 = 25$$

4. ..., 3, ____, ____, 375, ...

$$a_2 = 15$$

$$a_3 = 75$$

5. ..., 2, ____, ____, 54, ...

$$a_2 = 6$$

$$a_3 = 18$$

6. ..., -3, ____, ____, -192, ...

$$a_2 = -12$$

$$a_3 = -48$$

7. ..., -1, ____, ____, ____, -81, ...

$$a_2 = -3$$

$$a_3 = -9$$

$$a_4 = -27$$

8. ..., -2, ____, ____, ____, -162, ...

$$a_2 = -6$$

$$a_3 = -18$$

$$a_4 = -54$$

9. ..., -1, ____, ____, ____, -1296, ...

$$a_2 = -6$$

$$a_3 = -36$$

$$a_4 = -216$$

10. ..., 2, ____, ____, ____, 512, ...

$$a_2 = 8$$

$$a_3 = 32$$

$$a_4 = 128$$

<p>11. ..., -2, ..., ..., -1250, ...</p> <p>$a_2 = -10$</p> <p>$a_3 = -50$</p> <p>$a_4 = -250$</p>	<p>12. ..., -2, ..., ..., -512, ...</p> <p>$a_2 = -8$</p> <p>$a_3 = -32$</p> <p>$a_4 = -128$</p>
<p>13. ..., 4, ..., ..., 128, ...</p> <p>$a_2 = 8$</p> <p>$a_3 = 16$</p> <p>$a_4 = 32$</p> <p>$a_5 = 64$</p>	<p>14. ..., 2, ..., ..., 64, ...</p> <p>$a_2 = 4$</p> <p>$a_3 = 8$</p> <p>$a_4 = 16$</p> <p>$a_5 = 32$</p>
<p>15. ..., -4, ..., ..., -31104, ...</p> <p>$a_2 = -24$</p> <p>$a_3 = -144$</p> <p>$a_4 = -864$</p> <p>$a_5 = -5184$</p>	<p>16. ... 2, ..., ..., 486, ...</p> <p>$a_2 = 6$</p> <p>$a_3 = 18$</p> <p>$a_4 = 54$</p> <p>$a_5 = 162$</p>
<p>17. ..., 1, ..., ..., 15625, ...</p> <p>$a_2 = 5$</p> <p>$a_3 = 25$</p> <p>$a_4 = 125$</p> <p>$a_5 = 625$</p> <p>$a_6 = 3125$</p>	<p>18. ..., -3, ..., ..., -46875, ...</p> <p>$a_2 = -15$</p> <p>$a_3 = -75$</p> <p>$a_4 = -375$</p> <p>$a_5 = -1875$</p> <p>$a_6 = -9375$</p>
<p>19. ..., 2, ..., ..., 31250, ...</p> <p>$a_2 = 10$</p> <p>$a_3 = 50$</p> <p>$a_4 = 250$</p> <p>$a_5 = 1250$</p> <p>$a_6 = 6250$</p>	<p>20. ..., -1, ..., ..., -729, ...</p> <p>$a_2 = -3$</p> <p>$a_3 = -9$</p> <p>$a_4 = -27$</p> <p>$a_5 = -81$</p> <p>$a_6 = -243$</p>

$$\textcircled{1} \dots, \underset{a_1}{-4}, \underset{a_2}{\quad}, \underset{a_3}{-144}, \dots$$

$$a_2 = -4 \cdot 6 = \boxed{-24}$$

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

$$-144 = -4 (r)^{3-1}$$

$$\frac{-144}{-4} = \frac{-4 (r)^2}{-4}$$

$$\sqrt[3]{36} = \sqrt{r^2}$$

$$6 = r$$

$$\textcircled{2} \dots, \underset{a_1}{4}, \underset{a_2}{\quad}, \underset{a_3}{100}, \dots$$

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

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

$$100 = 4 (r)^{3-1}$$

$$\frac{100}{4} = \frac{4 (r)^2}{4}$$

$$\sqrt{25} = \sqrt{r^2}$$

$$5 = r$$

$$\textcircled{3} \dots, \underset{a_1}{1}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{125}, \dots$$

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

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

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

$$125 = 1 (r)^{4-1}$$

$$\frac{125}{1} = \frac{1 (r)^3}{1}$$

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

$$5 = r$$

$$\textcircled{4} \dots, \underset{a_1}{3}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{375}, \dots$$

$$a_2 = 3 \cdot 5 = \boxed{15}$$

$$a_3 = 15 \cdot 5 = \boxed{75}$$

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

$$375 = 3 (r)^{4-1}$$

$$\frac{375}{3} = \frac{3 (r)^3}{3}$$

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

$$5 = r$$

$$\textcircled{5} \dots, \underset{a_1}{2}, \underset{a_2}{\quad}, \underset{a_3}{\quad}, \underset{a_4}{54}, \dots$$

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

$$a_3 = 6 \cdot 3 = \boxed{18}$$

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

$$54 = 2 (r)^{4-1}$$

$$\frac{54}{2} = \frac{2 (r)^3}{2}$$

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

$$3 = r$$

$$\textcircled{6} \dots, -3, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, -192, \dots$$

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

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

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

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

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

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

$$4 = r$$

$$\textcircled{7} \dots, -1, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, -81, \dots$$

$$a_2 = -1 \cdot 3 = \boxed{-3}$$

$$a_3 = -3 \cdot 3 = \boxed{-9}$$

$$a_4 = -9 \cdot 3 = \boxed{-27}$$

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

$$-81 = -1(r)^{5-1}$$

$$\frac{-81}{-1} = \frac{-1(r)^4}{-1}$$

$$\sqrt[4]{81} = \sqrt[4]{r^4}$$

$$3 = r$$

$$\textcircled{8} \dots, -2, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, -162, \dots$$

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

$$a_3 = -6 \cdot 3 = \boxed{-18}$$

$$a_4 = -18 \cdot 3 = \boxed{-54}$$

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

$$-162 = -2(r)^{5-1}$$

$$\frac{-162}{-2} = \frac{-2(r)^4}{-2}$$

$$\sqrt[4]{81} = \sqrt[4]{r^4}$$

$$3 = r$$

$$\textcircled{9} \dots, -1, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, -1296, \dots$$

$$a_2 = -1 \cdot 6 = \boxed{-6}$$

$$a_3 = -6 \cdot 6 = \boxed{-36}$$

$$a_4 = -36 \cdot 6 = \boxed{-216}$$

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

$$-1296 = -1(r)^{5-1}$$

$$\frac{-1296}{-1} = \frac{-1(r)^4}{-1}$$

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

$$6 = r$$

$$\textcircled{10} \dots, 2, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, 512, \dots$$

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

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

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

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

$$512 = 2(r)^{5-1}$$

$$\frac{512}{2} = \frac{2(r)^4}{2}$$

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

$$4 = r$$

$$\textcircled{11} \dots -2, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, -1250, \dots$$

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

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

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

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

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

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

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

$$5 = r$$

$$\textcircled{12} \dots, -2, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, -512, \dots$$

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

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

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

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

$$-512 = -2(r)^{5-1}$$

$$\frac{-512}{-2} = \frac{-2(r)^4}{-2}$$

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

$$4 = r$$

$$\textcircled{13} \dots, 4, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, 128, \dots$$

$$a_2 = 4 \cdot 2 = \boxed{8} \quad a_4 = 16 \cdot 2 = \boxed{32}$$

$$a_3 = 8 \cdot 2 = \boxed{16} \quad a_5 = 32 \cdot 2 = \boxed{64}$$

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

$$128 = 4(r)^{6-1}$$

$$\frac{128}{4} = \frac{4(r)^5}{4}$$

$$\sqrt[5]{32} = \sqrt[5]{r^5}$$

$$2 = r$$

$$\textcircled{14} \dots, 2, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, 64, \dots$$

$$a_2 = 2 \cdot 2 = \boxed{4} \quad a_4 = 8 \cdot 2 = \boxed{16}$$

$$a_3 = 4 \cdot 2 = \boxed{8} \quad a_5 = 16 \cdot 2 = \boxed{32}$$

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

$$64 = 2(r)^{6-1}$$

$$\frac{64}{2} = \frac{2(r)^5}{2}$$

$$\sqrt[5]{32} = \sqrt[5]{r^5}$$

$$2 = r$$

$$\textcircled{15} \dots, -4, \frac{\quad}{a_2}, \frac{\quad}{a_3}, \frac{\quad}{a_4}, \frac{\quad}{a_5}, -31104, \dots$$

$$a_2 = -4 \cdot 6 = \boxed{-24} \quad a_4 = -144 \cdot 6 = \boxed{-864}$$

$$a_3 = -24 \cdot 6 = \boxed{-144} \quad a_5 = -864 \cdot 6 = \boxed{-5184}$$

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

$$-31104 = -4(r)^{6-1}$$

$$\frac{-31104}{-4} = \frac{-4(r)^5}{-4}$$

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

$$6 = r$$

$$\textcircled{16} \dots, 2, \dots, \dots, \dots, 486, \dots$$

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

$$a_4 = 18 \cdot 3 = \boxed{54}$$

$$a_3 = 6 \cdot 3 = \boxed{18}$$

$$a_5 = 54 \cdot 3 = \boxed{162}$$

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

$$486 = 2(r)^{6-1}$$

$$\frac{486}{2} = \frac{2(r)^5}{2}$$

$$\sqrt[5]{243} = \sqrt[5]{r^5}$$

$$3 = r$$

$$\textcircled{17} \dots, 1, \dots, \dots, \dots, 15625, \dots$$

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

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

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

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

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

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

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

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

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

$$5 = r$$

$$\textcircled{18} \dots, -3, \dots, \dots, \dots, -46875, \dots$$

$$a_2 = -3 \cdot 5 = \boxed{-15}$$

$$a_5 = -375 \cdot 5 = \boxed{-1875}$$

$$a_3 = -15 \cdot 5 = \boxed{-75}$$

$$a_6 = -1875 \cdot 5 = \boxed{-9375}$$

$$a_4 = -75 \cdot 5 = \boxed{-375}$$

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

$$-46875 = -3(r)^{7-1}$$

$$\frac{-46875}{-3} = \frac{-3(r)^6}{-3}$$

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

$$5 = r$$

$$\textcircled{19} \dots, 2, \dots, \dots, \dots, 31250, \dots$$

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

$$a_5 = 250 \cdot 5 = \boxed{1250}$$

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

$$a_6 = 1250 \cdot 5 = \boxed{6250}$$

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

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

$$31250 = 2(r)^{7-1}$$

$$\frac{31250}{2} = \frac{2(r)^6}{2}$$

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

$$5 = r$$

$$\textcircled{20} \dots, -1, \dots, \dots, \dots, -729, \dots$$

$$a_2 = -1 \cdot 3 = \boxed{-3}$$

$$a_5 = -27 \cdot 3 = \boxed{-81}$$

$$a_3 = -3 \cdot 3 = \boxed{-9}$$

$$a_6 = -81 \cdot 3 = \boxed{-243}$$

$$a_4 = -9 \cdot 3 = \boxed{-27}$$

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

$$-729 = -1(r)^{7-1}$$

$$\frac{-729}{-1} = \frac{-1(r)^6}{-1}$$

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

$$3 = r$$