

Recursive Formula

Unit 7: Representations of Exponential Relations

Identify the first term of the sequence and the common ratio, and then find the recursive formula.

<p>1. $-2, 4, -8, 16, \dots$</p> <p>$r = \frac{4}{-2} = -2$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = -2$ $a_n = a_{n-1} \cdot -2$</p>	<p>2. $375, -75, 15, -3, \dots$</p> <p>$r = \frac{-75}{375} = -\frac{1}{5}$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = 375$ $a_n = a_{n-1} \cdot -\frac{1}{5}$</p>
<p>3. $0.5, -2, 8, -32, \dots$</p> <p>$r = \frac{-2}{0.5} = -4$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = 0.5$ $a_n = a_{n-1} \cdot -4$</p>	<p>4. $1, 3, 9, 27, \dots$</p> <p>$r = \frac{3}{1} = 3$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = 1$ $a_n = a_{n-1} \cdot 3$</p>
<p>5. $3, 18, 108, 648, \dots$</p> <p>$r = \frac{18}{3} = 6$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = 3$ $a_n = a_{n-1} \cdot 6$</p>	<p>6. $1, 2, 4, 8, \dots$</p> <p>$r = \frac{2}{1} = 2$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = 1$ $a_n = a_{n-1} \cdot 2$</p>
<p>7. $-2.5, -5, -10, -20, \dots$</p> <p>$r = \frac{-5}{-2.5} = 2$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = -2.5$ $a_n = a_{n-1} \cdot 2$</p>	<p>8. $4, -\frac{2}{3}, \frac{1}{9}, -\frac{1}{54}, \dots$</p> <p>$r = \frac{-2/3}{4} = -\frac{1}{6}$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = 4$ $a_n = a_{n-1} \cdot -\frac{1}{6}$</p>
<p>9. $-2, -10, -50, -250, \dots$</p> <p>$r = \frac{-10}{-2} = 5$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = -2$ $a_n = a_{n-1} \cdot 5$</p>	<p>10. $5120, 1280, 320, 80, \dots$</p> <p>$r = \frac{1280}{5120} = \frac{1}{4}$ $a_n = a_{n-1} \cdot r$</p> <p>$a_1 = 5120$ $a_n = a_{n-1} \cdot \frac{1}{4}$</p>

11. $-5, -\frac{5}{3}, -\frac{5}{9}, -\frac{5}{27}, \dots$

$$r = \frac{-5/3}{-5} = \frac{1}{3} \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -5$$

$$a_n = a_{n-1} \cdot \frac{1}{3}$$

12. $2, -\frac{1}{2}, \frac{1}{8}, -\frac{1}{32}, \dots$

$$r = \frac{-1/2}{2} = -\frac{1}{4} \quad a_n = a_{n-1} \cdot r$$

$$a_1 = 2$$

$$a_n = a_{n-1} \cdot -\frac{1}{4}$$

13. $-4, -20, -100, -500, \dots$

$$r = \frac{-20}{-4} = 5 \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -4$$

$$a_n = a_{n-1} \cdot 5$$

14. $32, 16, 8, 4, \dots$

$$r = \frac{16}{32} = \frac{1}{2} \quad a_n = a_{n-1} \cdot r$$

$$a_1 = 32$$

$$a_n = a_{n-1} \cdot \frac{1}{2}$$

15. $-3, 9, -27, 81, \dots$

$$r = \frac{9}{-3} = -3 \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -3$$

$$a_n = a_{n-1} \cdot -3$$

16. $-1, -\frac{1}{4}, -\frac{1}{16}, -\frac{1}{64}, \dots$

$$r = \frac{-1/4}{-1} = \frac{1}{4} \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -1$$

$$a_n = a_{n-1} \cdot \frac{1}{4}$$

17. $-3, -18, -108, -648, \dots$

$$r = \frac{-18}{-3} = 6 \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -3$$

$$a_n = a_{n-1} \cdot 6$$

18. $-1, 5, -25, 125, \dots$

$$r = \frac{5}{-1} = -5 \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -1$$

$$a_n = a_{n-1} \cdot -5$$

19. $-2, -6, -18, -54, \dots$

$$r = \frac{-6}{-2} = 3 \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -2$$

$$a_n = a_{n-1} \cdot 3$$

20. $-3, -9, -27, -81, \dots$

$$r = \frac{-9}{-3} = 3 \quad a_n = a_{n-1} \cdot r$$

$$a_1 = -3$$

$$a_n = a_{n-1} \cdot 3$$