

Arithmetic & Geometric Sequence Worksheet

1. Find an explicit form $f(n)$ for each of the following arithmetic sequences (assume a is some real number and x is some real number).

a) $-34, -22, -10, 2, \dots$

b) $\frac{1}{5}, \frac{1}{10}, 0, -\frac{1}{10}, \dots$

c) $x + 4, x + 8, x + 12, x + 16, \dots$

d) $a, 2a + 1, 3a + 2, 4a + 3, \dots$

2. Find the common ratio and an explicit form in each of the following geometric sequences.

a) $4, 12, 36, 108, \dots$

b) $162, 108, 72, 48, \dots$

c) $\frac{4}{3}, \frac{2}{3}, \frac{1}{3}, \frac{1}{6}, \dots$

d) $xz, x^2z^3, x^3z^5, x^4z^7, \dots$

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1. Find an explicit form $f(n)$ for each of the following arithmetic sequences (assume a is some real number and x is some real number).

a) $-34, -22, -10, 2, \dots$

$$f(n) = -34 + 12(n - 1) = 12n - 46, \text{ where } n \geq 1$$

b) $\frac{1}{5}, \frac{1}{10}, 0, -\frac{1}{10}, \dots$

$$f(n) = \frac{1}{5} - \frac{1}{10}(n - 1) = \frac{3}{10} - \frac{1}{10}n, \text{ where } n \geq 1$$

c) $x + 4, x + 8, x + 12, x + 16, \dots$

$$f(n) = x + 4 + 4(n - 1) = x + 4n, \text{ where } n \geq 1$$

d) $a, 2a + 1, 3a + 2, 4a + 3, \dots$

$$f(n) = a + (a + 1)(n - 1) = a + an - a + n - 1 = an + n - 1, \text{ where } n \geq 1$$

2. Find the common ratio and an explicit form in each of the following geometric sequences.

a) $4, 12, 36, 108, \dots$

$$r = 3 \qquad f(n) = 4(3)^{n-1}, \text{ where } n \geq 1$$

b) $162, 108, 72, 48, \dots$

$$r = \frac{108}{162} = \frac{2}{3} \qquad f(n) = 162 \left(\frac{2}{3}\right)^{n-1}, \text{ where } n \geq 1$$

c) $\frac{4}{3}, \frac{2}{3}, \frac{1}{3}, \frac{1}{6}, \dots$

$$r = \frac{1}{2} \qquad f(n) = \left(\frac{4}{3}\right) \left(\frac{1}{2}\right)^{n-1} = \left(\frac{4}{3}\right) (2)^{1-n}, \text{ where } n \geq 1$$

d) $xz, x^2z^3, x^3z^5, x^4z^7, \dots$

$$r = xz^2 \qquad f(n) = xz(xz^2)^{n-1}, \text{ where } n \geq 1$$

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