

Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, the explicit formula, and the recursive formula.

1) 4, 7, 12, 19, ...

2) 20, 16, 12, 8, ...

3) -11, -13, -15, -17, ...

4) -35, -25, -15, -5, ...

Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, the explicit formula, and the recursive formula.

5) -2, 10, -50, 250, ...

6) 4, 16, 64, 256, ...

7) 2, 6, 18, 54, ...

8) 1, 5, 25, 125, ...

Evaluate each arithmetic series described.

$$9) \sum_{m=1}^{30} (6 - 10m)$$

$$10) \sum_{i=1}^{25} (10i - 19)$$

$$11) \sum_{i=1}^{20} (7i - 9)$$

$$12) \sum_{i=1}^9 (9i - 4)$$

Determine if each geometric series converges or diverges.

$$13) 8 + 7.2 + 6.48 + 5.832 \dots$$

$$14) 3 + \frac{3}{4} + \frac{3}{16} + \frac{3}{64} \dots$$

$$15) 4 - 12 + 36 - 108 \dots$$

$$16) -\frac{243}{625} - \frac{81}{125} - \frac{27}{25} - \frac{9}{5} \dots$$

Solve each equation.

$$17) 625^{3x} = \left(\frac{1}{25}\right)^x$$

$$18) 3^{-2n+1} = 1$$

$$19) 4^{2x} = 64$$

$$20) 5^{-2n} = 125$$

Solve each equation. Round your answers to the nearest ten-thousandth.

$$21) -5 \cdot 10^{5m} = -18$$

$$22) 18^{2k} + 8 = 86$$

$$23) -8 \cdot 15^{x+3} = -79$$

$$24) -7 \cdot 10^{10p} = -47$$

Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, the explicit formula, and the recursive formula.

1) 4, 7, 12, 19, ...

Not arithmetic

2) 20, 16, 12, 8, ...

Common Difference: $d = -4$

$a_{52} = -184$

Explicit: $a_n = 24 - 4n$

Recursive: $a_n = a_{n-1} - 4$

$a_1 = 20$

3) -11, -13, -15, -17, ...

Common Difference: $d = -2$

$a_{52} = -113$

Explicit: $a_n = -9 - 2n$

Recursive: $a_n = a_{n-1} - 2$

$a_1 = -11$

4) -35, -25, -15, -5, ...

Common Difference: $d = 10$

$a_{52} = 475$

Explicit: $a_n = -45 + 10n$

Recursive: $a_n = a_{n-1} + 10$

$a_1 = -35$

Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, the explicit formula, and the recursive formula.

5) -2, 10, -50, 250, ...

Common Ratio: $r = -5$

$a_8 = 156250$

Explicit: $a_n = -2 \cdot (-5)^{n-1}$

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

$a_1 = -2$

6) 4, 16, 64, 256, ...

Common Ratio: $r = 4$

$a_8 = 65536$

Explicit: $a_n = 4 \cdot 4^{n-1}$

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

$a_1 = 4$

7) 2, 6, 18, 54, ...

Common Ratio: $r = 3$

$a_8 = 4374$

Explicit: $a_n = 2 \cdot 3^{n-1}$

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

$a_1 = 2$

8) 1, 5, 25, 125, ...

Common Ratio: $r = 5$

$a_8 = 78125$

Explicit: $a_n = 5^{n-1}$

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

$a_1 = 1$

Evaluate each arithmetic series described.

$$9) \sum_{m=1}^{30} (6 - 10m)$$

-4470

$$10) \sum_{i=1}^{25} (10i - 19)$$

2775

$$11) \sum_{i=1}^{20} (7i - 9)$$

1290

$$12) \sum_{i=1}^9 (9i - 4)$$

369

Determine if each geometric series converges or diverges.

$$13) 8 + 7.2 + 6.48 + 5.832 \dots$$

Converges

$$14) 3 + \frac{3}{4} + \frac{3}{16} + \frac{3}{64} \dots$$

Converges

$$15) 4 - 12 + 36 - 108 \dots$$

Diverges

$$16) -\frac{243}{625} - \frac{81}{125} - \frac{27}{25} - \frac{9}{5} \dots$$

Diverges

Solve each equation.

$$17) 625^{3x} = \left(\frac{1}{25}\right)^x$$

{0}

$$18) 3^{-2n+1} = 1 \quad \left\{ \frac{1}{2} \right\}$$

$$19) 4^{2x} = 64 \quad \left\{ \frac{3}{2} \right\}$$

$$20) 5^{-2n} = 125 \quad \left\{ -\frac{3}{2} \right\}$$

Solve each equation. Round your answers to the nearest ten-thousandth.

$$21) -5 \cdot 10^{5m} = -18$$

0.1113

$$22) 18^{2k} + 8 = 86$$

0.7537

$$23) -8 \cdot 15^{x+3} = -79$$

-2.1544

$$24) -7 \cdot 10^{10p} = -47$$

0.0827