

Determine the common difference or ratio and find the next 4 terms of each sequence.

1. 7, 18, 29, ...

$$d = 11$$

$$40, 51, 62, 73$$

2. 12, 6, 3, ...

$$r = \frac{1}{2} \text{ or } 0.5$$

$$1.5, 0.75, 0.375, 0.1875$$

Find the indicated term for the following sequence

3. $a_1 = 6, a_n = a_{n-1} + 4; a_5$

$$a_5 = 6 + 4(5-1)$$

$$a_5 = 22$$

4. $a_n = 1.25(3)^{n-1}; a_{14}$

$$a_{14} = 1.25(3)^{14-1}$$

$$a_{14} = 1992903.75$$

5. $a_n = \frac{2}{3}n + 9; a_{27}$

$$a_{27} = \frac{2}{3}(27) + 9$$

$$a_{27} = 27$$

Write an explicit (closed) rule and a recursive rule for the following sequences:

6. 11, 4, -3, -10, ...

$$\text{Exp: } a_n = 11 + -7(n-1)$$

$$a_n = -7n + 18$$

$$\text{Rec: } a_1 = 11$$

$$a_n = a_{n-1} - 7$$

7. 4, 20, 100, 500, ...

$$\text{Exp: } a_n = 4(5)^{n-1}$$

$$\text{Rec: } a_1 = 4$$

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

8. 120, 96, 76.8, 61.44, ...

$$\text{Exp: } a_n = 120(0.8)^{n-1}$$

$$\text{Rec: } a_1 = 120$$

$$a_n = 0.8a_{n-1}$$

Find the indicated item

9. If $a_{13} = 78$ and $d = 4$, find a_1 $n = 13$

$$a_{13} = a_1 + d(n-1)$$

$$78 = a_1 + 4(13-1)$$

$$78 = a_1 + 4(12)$$

$$78 = a_1 + 48$$

$$30 = a_1$$

10. If $a_n = 52, d = 5$, and $a_1 = -8$, find n

$$a_n = a_1 + d(n-1)$$

$$52 = -8 + 5(n-1)$$

$$52 = -8 + 5n - 5$$

$$52 = 5n - 13$$

$$65 = 5n$$

$$13 = n$$

11. If $a_1 = 12, r = 1.5$, and $a_n = 91.125$, find n

$$a_n = a_1 \cdot r^{n-1}$$

$$\frac{91.125}{12} = \frac{12(1.5)^{n-1}}{12}$$

$$7.59375 = 1.5^{n-1}$$

$$\log_{1.5} 7.59375 = n-1 \quad \boxed{\text{OR}}$$

$$5 = n-1$$

$$\boxed{6 = n}$$

$$1.5^5 = 1.5^{n-1}$$

$$5 = n-1$$

$$\boxed{6 = n}$$

12. If $a_1 = 25$ and $a_7 = 1.1664$, find r

$$a_n = a_1 \cdot r^{n-1}$$

$$a_7 = 25r^{7-1}$$

$$\frac{1.1664}{25} = \frac{25r^6}{25}$$

$$\sqrt[6]{0.046656} = \sqrt[6]{r^6}$$

$$\boxed{\frac{3}{5} = r}$$