

Find the 66th term in the sequence

$$a_5=6, \quad a_8=15, \quad a_{10}=21, \quad a_{66}=\underline{\quad?}$$

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$$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10} \quad a_{66}$$

$$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{6}, \underline{\quad}, \underline{\quad}, \underline{15}, \underline{\quad}, \underline{21} \dots \underline{\quad}$$

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$$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{6}, \underline{\quad}, \underline{\quad}, \underline{15}, \underline{\quad}, \underline{21} \dots \underline{\quad}$$


The diagram shows five brackets, each labeled '+d', positioned below the sequence terms. The first bracket is between the 5th and 6th terms, the second between the 6th and 7th terms, the third between the 7th and 8th terms, the fourth between the 8th and 9th terms, and the fifth between the 9th and 10th terms. The 5th term is 6, the 8th term is 15, and the 10th term is 21.

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$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, a_{66}$

 , , , , 6, , , 15, , 21 ... ?



$$6+d+d+d=15 \quad 15+d+d=21$$

$$6+3d=15 \quad 15+2d=21$$

$$3d=9 \quad 2d=6$$

$$d=3 \quad d=3$$

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$$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, \dots, a_{66}$$
$$_, _, _, _, \underline{6}, _, _, \underline{15}, _, \underline{21} \dots \underline{?}$$

$+d$ $+d$ $+d$ $+d$ $+d$

$$6+d+d+d=15 \quad 15+d+d=21$$

$$6+3d=15 \quad 15+2d=21$$

$$3d=9 \quad 2d=6$$

$$d=3 \quad d=3$$

$$d=3$$

$$a_n = dn + a_0$$

$$6 = 3(5) + a_0$$

$$6 = 15 + a_0$$

$$-9 = a_0$$

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$$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, \dots, a_{66}$$
$$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{6}, \underline{\quad}, \underline{\quad}, \underline{15}, \underline{\quad}, \underline{21} \dots \underline{\quad}$$



$$a_n = dn + a_0$$

$$a_n = 3n + -9$$

$$6 + d + d + d = 15 \quad 15 + d + d = 21$$

$$6 + 3d = 15 \quad 15 + 2d = 21$$

$$3d = 9 \quad 2d = 6$$

$$d = 3 \quad d = 3$$

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$$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{6}, \underline{\quad}, \underline{\quad}, \underline{15}, \underline{\quad}, \underline{21} \dots \underline{\quad}$$



$$a_n = dn + a_0$$

$$a_n = 3n + -9$$

$$a_{66} = 3(66) + -9$$

$$a_{66} = 189$$

$$6 + d + d + d = 15 \quad 15 + d + d = 21$$

$$6 + 3d = 15 \quad 15 + 2d = 21$$

$$3d = 9 \quad 2d = 6$$

$$d = 3 \quad d = 3$$

$$d = 3$$

$$a_n = dn + a_0$$

$$6 = 3(5) + a_0$$

$$6 = 15 + a_0$$

$$-9 = a_0$$

Find the 17th term in the sequence

$$a_5=4, \quad a_8=32, \quad a_{10}=128, \quad a_{17}=\underline{\quad?}$$

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$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, a_{17}$

$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{4}, \underline{\quad}, \underline{\quad}, \underline{32}, \underline{\quad}, \underline{128} \dots \underline{\quad?}$



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$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, a_{17}$

$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{4}, \underline{\quad}, \underline{\quad}, \underline{32}, \underline{\quad}, \underline{128}, \dots \underline{\quad?}$



$$4+d+d+d=32 \quad 32+d+d=128$$

$$4+3d=32 \quad 32+2d=128$$

$$3d=28 \quad 2d=96$$

$$d=9\frac{1}{3} \quad d=48$$

NOT ARITHMETIC

Find the 17th term in the sequence

$$a_5=4, \quad a_8=32, \quad a_{10}=128, \quad a_{17}=\underline{\quad?}$$

$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, a_{17}$

$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{4}, \underline{\quad}, \underline{\quad}, \underline{32}, \underline{\quad}, \underline{128}, \dots \underline{?}$



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$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{4}, \underline{\quad}, \underline{\quad}, \underline{32}, \underline{\quad}, \underline{128}, \dots, \underline{\quad?}$



$$4 \cdot r \cdot r \cdot r = 32 \quad 32 \cdot r \cdot r = 128$$

$$4 \cdot r^3 = 32 \quad 32 \cdot r^2 = 128$$

$$r^3 = 8 \quad r^2 = 4$$

$$r = 2 \quad r = 2$$

Find the 17th term in the sequence

$$a_5 = 4,$$

$$a_8 = 32,$$

$$a_{10} = 128,$$

$$a_{17} = \underline{\quad}$$

$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, a_{17}$
 $\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{4}, \underline{\quad}, \underline{\quad}, \underline{32}, \underline{\quad}, \underline{128}, \dots, \underline{\quad}$



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$$4 \cdot r^3 = 32 \quad 32 \cdot r^2 = 128$$

$$r^3 = 8 \quad r^2 = 4$$

$$r = 2 \quad r = 2$$

$$r = 2$$

$$a_n = a_0 \cdot r^n$$

$$4 = a_0 \cdot 2^5$$

$$4 = a_0 \cdot 32$$

$$0.125 = a_0$$

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$$a_5=4, \quad a_8=32, \quad a_{10}=128, \quad a_{17}=?$$

$$a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, \dots, a_{17}$$

$$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{4}, \underline{\quad}, \underline{\quad}, \underline{32}, \underline{\quad}, \underline{128}, \dots, \underline{\quad}$$



$$a_n = a_0 \cdot r^n$$

$$a_n = 0.125 \cdot 2^n$$

$$a_{17} = 0.125 \cdot 2^{17}$$

$$a_{17} = 16384$$

$$4 \cdot r \cdot r \cdot r = 32 \quad 32 \cdot r \cdot r = 128$$

$$4 \cdot r^3 = 32 \quad 32 \cdot r^2 = 128$$

$$r^3 = 8 \quad r^2 = 4$$

$$r = 2 \quad r = 2$$

$$r = 2$$

$$a_n = a_0 \cdot r^n$$

$$4 = a_0 \cdot 2^5$$

$$4 = a_0 \cdot 32$$

$$0.125 = a_0$$