Find the 10th term in each sequence.

1. $11, 17, 23, 29, \ldots$ → Arithmetic Sequence
    $\underset{+6}{\smallsmile}\underset{+6}{\smallsmile}\underset{+6}{\smallsmile}$

$t_1 = 11$
$t_2 = 11 + 6$
$t_3 = 11 + 6 + 6$
$t_4 = 11 + 6 + 6 + 6$

each term has
an 11 & the # of 6's
added is always one
less than the term #.

$$\boxed{t_n = 11 + 6(n-1)}$$

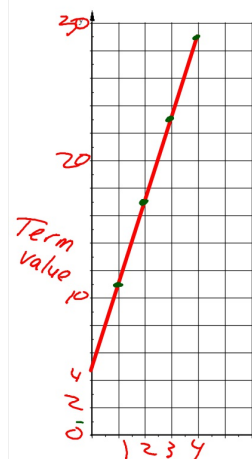$t_{10} = 11 + 6(10-1)$
$= 11 + 6(9)$
$= 11 + 54 = \boxed{65}$

$t_n = 11 + 6(n-1)$
You can simplify this

$t_n = 11 + 6n - 6$

$\boxed{t_n = 6n + 5}$

↑ this is a
Linear function

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1. $11, 17, 23, 29, \ldots$

Graph is a linear
function → $y = mx + b$

Term
value

Term #

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1. $11, 17, 23, 29, \ldots$

n - term #	Y - term value
1	11
2	17
3	23
4	29

+1 ... +6
+1 ... +6
+1 ... +6

when writing the
terms as ordered
pairs they create a
linear function:

$$\boxed{y = 6x + 5}$$

every time
X increases by 1
y increases by 6

slope $= \frac{6}{1} = 6$

$\boxed{m = 6}$

the y-int is when
X=0. If you reduce
X by 1 you must
decrease y by 6.

X	Y
0	5

$\boxed{b = 5}$

What's the 100th term?

1. $11, 17, 23, 29, \ldots$

$t_n = 11 + 6(n-1)$

$t_{100} = 11 + 6(100-1)$

$= 11 + 6(99)$

$= \boxed{605}$

Find the 10th term in each sequence.

2. $2, 6, 18, 54, \ldots$ $\times 3$

   $\times 3$ $\times 3$

Geometric Sequence

$t_1 = 2$

$t_2 = 2 \cdot 3$

$t_3 = 2 \cdot 3 \cdot 3$

$t_4 = 2 \cdot 3 \cdot 3 \cdot 3$

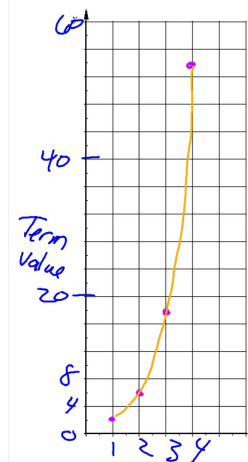there is always one less 3 than the term #

$$t_n = 2 \cdot 3^{n-1}$$

$t_{10} = 2 \cdot 3^{10-1}$

$= 2 \cdot 3^9$

$= 39{,}366$

This is an Exponential Equation

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2. $2, 6, 18, 54, \ldots$

• Graph is a curve

Term Value (y-axis: 4, 8, 20, 40), Term # (x-axis: 1 2 3 4)

What's the 100th term?

2. $2, 6, 18, 54, \ldots$

$t_n = 2 \cdot 3^{n-1}$

$t_{100} = 2 \cdot 3^{99} = 3.43585 \text{ E } 47$

$$3.43585 \times 10^{47}$$

Linear Function:

• Equation can be expressed in the form: $y = mx + b$
• Has a Constant Rate of Change → Slope
• Largest exponent on the variable is 1
• Graph is a line

The following table represents a linear function.

Write a y = mx + b equation (Slope-Inercept Eq) to model this data.

X	Y
1	7
2	12
3	17
4	22
5	27

$(1, 7)$
 X Y

$7 = m + b$

$(2, 12)$ $12 = 2m + b$
 X Y

solve this system of eq's using substitution or elimination

using Elimination:

$12 = 2m + b$
$7 = m + b$
_____
$5 = m$

$7 = 5 + b$
$-5 \quad -5$
$2 = b$

$y = 5x + 2$

Exponential Function:

- Graph is a curve
- Graph has asymptote
- growth/decay

- Created by repeatedly multiplying some initial value by a constant.

- An equation where the independent variable is located in the exponent.

- Equation has the following form: $y = a \cdot b^x$