

# Linear, Quadratic or Exponential?



## Key idea



The type comes from how the terms change:

**Linear** — constant first difference.

**Quadratic** — constant second difference.

**Exponential** — constant ratio.

## How to check



First differences constant  $\Rightarrow$   
**Linear.**

Second differences constant  $\Rightarrow$   
**Quadratic.**

Constant ratio  $\Rightarrow$  **Exponential.**

## Common mistake

Fast growth is not always exponential — check the ratio is constant.



# One of Each



## Linear



4, 7, 10, 13, 16

First differences  $+3, +3, +3, +3$   
are constant, so it is linear.

## Quadratic



1, 4, 9, 16, 25

First differences 3, 5, 7, 9; second  
differences  $+2, +2, +2$  are con-  
stant, so it is quadratic.

## Exponential



3, 6, 12, 24, 48

Each term  $\times 2$ . The ratio is con-  
stant, so it is exponential.

## Common mistake

2, 4, 8, 16 is not linear: the first  
differences 2, 4, 8 are not con-  
stant, so check the ratio.



**= copy this into your book.** Boxes without a pencil are just to read.

Identifying linear, quadratic, and exponential patterns



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