# The Middle Term of a Geometric Sequence

如果 $a, b, c$ 三數成等比數列，則 $b$ 稱為 $a$ 與 $c$ 的 <span style="color:red">**等比中項**</span>。

例如：$8, -4, 2$ 成等比數列，則 $-4$ 為 $8$ 與 $2$ 的等比中項。

因此，若 $a, b, c$ 三數成等比數列，則 $\dfrac{b}{a} = \dfrac{c}{b}$

$$b^2 = ac$$
$$b = \pm\sqrt{ac}$$

---

翻譯示例：

The Middle Term of a Geometric Sequence

If $a$, $b$, and $c$ are consecutive terms in a geometric sequence, then $b$ is called the Middle Term of a Geometric Sequence of $a$ and $c$.

For example, if $8, -4$, and $2$ form a geometric sequence, then $-4$ is the Middle Term of the geometric sequence of 8 and 2.

Therefore, if the three numbers $a$, $b$, and $c$ form a geometric sequence,

then $\dfrac{b}{a} = \dfrac{c}{b}$

$b^2 = ac$

$b = \pm\sqrt{ac}$

---

## 【等比中項公式】

若 $b$ 為 $a$ 與 $c$ 的等比中項，則 $b^2 = ac$，即 $b = \pm\sqrt{ac}$。

---

　　上面的推導過程中，從 $b^2 = ac$ 可以看出 $a \times c$ 是正數，所以當 $a$ 與 $c$ 必須同時為正數或同時為負數時，才會有等比中項。

---

翻譯示例：

The Middle Term of a Geometric Sequence formula

If $b$ is the Middle Term of a Geometric Sequence of $a$ and $c$, then $b^2 = ac$. $b = \pm\sqrt{ac}$

In the above derivation, because $b^2 = ac$ we can see that $a \times c$ is a positive number.

There is a middle term of a geometric sequence when $a$ and $c$ must be positive or negative at the same time.

**等比中項的應用**

Q1 已知 $2, a, 8$ 三數成等比數列，求 $a$ 的值。

解：

因為 $2, a, 8$ 三數成等比，

所以 $a^2 = 2 \times 8 = 16$，$a = \pm 4$。

---

翻譯示例：

An application for the middle term the middle term of a geometric sequence.

The three numbers 2, $a$, and 8 form a geometric sequence. Find the value of $a$.

Solution:

Because 2, $a$, and 8 is a geometric sequence,

So, $a^2 = 2 \times 8 = 16$ and $a = \pm 4$

---

**等比中項的應用**

Q1 已知 $2, a, 8$ 三數成等比數列，求 $a$ 的值。

解：

因為 $2, a, 8$ 三數成等比，

所以 $a^2 = 2 \times 8 = 16$，$a = \pm 4$。

# 參考資料來源

1. 110 國中數學 2 下翰林版課本

2. IB Maths SL Book Oxford

   Chapter 6 Patterns, sequences, and series

3. Holt McDougal Larson Algebra 2

   Chapter 7 Sequences and Series

4. [Number Sequences - Square, Cube, and Fibonacci (mathsisfun.com)](https://www.mathsisfun.com/numberpatterns.html)

   https://www.mathsisfun.com/numberpatterns.html

☆老師們可以自己從中選擇以做出適合自己學生程度的學習單或是在課堂中適時補充這些英文。

製作者：康橋國際學校　　陳怡伶