



The Missing Rung



COMPLETE TO COLLECT
Polished Smoky Quartz
 Level 3 · 5 Glints

MEDITATIONS ON ONENESS

LOCAL FOLIO MARK · 111

PAGE 1 · DESCEND THE PRODUCT LADDER

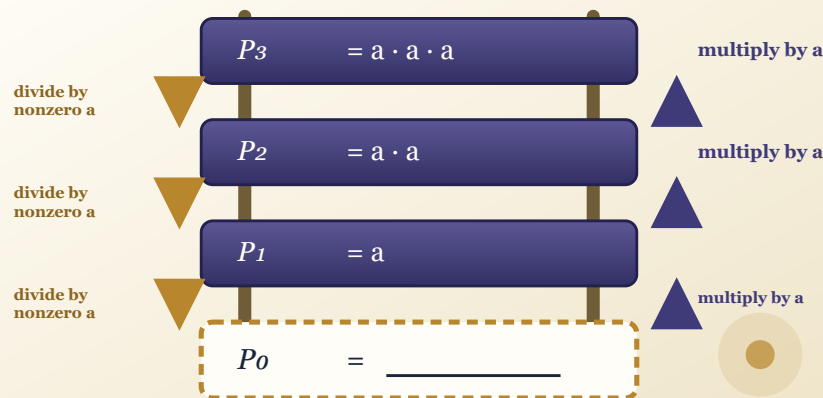
LUNA'S DESCENDING RECORD

In an Archive field note, Luna fixes a nonzero real number a . She lets P_n be the product of n copies of a :

$$P_3 = a \cdot a \cdot a, \quad P_2 = a \cdot a, \quad P_1 = a.$$

Every neighboring pair follows the same rule: $P_{n+1} = aP_n$.

LUNA'S MARGIN *The next rung is absent. The neighboring rule is not.*



Write the value of P_0 on the missing rung only after you can prove it is forced.

COMPLETE THE LADDER

Write on the missing rung. Use scratch paper for the proof.

- A missing rung P_0 lies below P_1 . Find the only value of P_0 that lets the same neighboring-rung rule hold at $n = 0$. Explain exactly where the condition $a \neq 0$ is used.



PAGE 2 · FOLLOW TWO ECHOES
POWERS AND EMPTY PRODUCTS

Exponent notation

We write $P_n = a^n$.

For $a \neq 0$, the quotient rule is $\frac{a^r}{a^s} = a^{r-s}$.

Split a product

The product of a whole list equals the product of its left block times the product of its right block.

TWO VIEWS OF THE SAME ONE

Use separate paper for your explanations.

- What must a^0 mean? Then check $\frac{a^{111}}{a^{111}}$ in two ways: as a nonzero number divided by itself, and using the exponent-division rule.
- To preserve the product-splitting rule when one block contains no factors, what must the product of the empty block be? Prove that no other value works.

$a^0 = \underline{\hspace{2cm}}$ product of the empty block = $\underline{\hspace{2cm}}$

Zero factors do not erase a product. They leave multiplication ready to begin.

