Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Finding Rules of Exponents

Use patterns to discover rules for multiplying and dividing powers.

Copy and complete each table.

**PRODUCTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Expression** | **Expression written as repeated multiplication** | **Number of Factors** | **Product as a power** |
|  | (2 | 9 |  |
|  | ( (3) | ? 5 | 5 |
| ∙ | ? | ? 4 | ? |

(5)∙ (5∙5∙5)

**QUOTIENTS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Expression** | **Expression written as repeated multiplication** | **Simplified Expression** | **Number of Factors** | **Quotient as a power** |
|  |  | 2∙2∙2∙2 | 4 |  |
|  | ? | ? 3∙3∙3∙3 | ? | ? |
|  | ? | ? 5 | ? 1 | ? |

Row 2: Row 3:

DRAW CONCLUSIONS

1. **Critical Thinking** In the *Products* table, how are the exponents in the first and last columns related? [The exponents in the last column are the sums of the exponents in the corresponding rows of the first columns.]

2. Use your answer to Exercise 1 to write the products ∙ as a power. [ ]

3. **Critical Thinking** In the *Quotients* table, how are the exponents in the first and last columns related? [The exponents in the last column are the differences of the exponents in the corresponding rows of the first columns.]

4. Use your answer to Exercise 3 to write the quotient as a power. [ ]