## Lesson 18: Bases and Exponents

* Let’s rewrite expressions using the property .

### 18.1: Math Talk: Different Bases

Decide if each expression is equal to .

### 18.2: What’s the Factor?

1. Refer to the first table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| * step | * 0 | * 1 | * 2 | * 3 | * 4 | * 5 | * 6 |
| * value | * 10 | * 30 | * 90 | * 270 |  |  |  |
| * expression |  |  |  |  |  |  |  |

* 1. Predict the value in steps 4, 5, and 6.
  2. By what factor does the value change . . .
     1. from step 1 to step 4?
     2. from step 3 to step 6?
     3. Conjecture about the factor from step 7 to step 10.
  3. By what factor does the value change . . .
     1. from step 0 to step 5?
     2. from step 1 to step 6?
     3. Conjecture about the factor from step 10 to step 15.

1. Refer to the second table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| * step | * 0 | * 1 | * 2 | * 3 | * 4 | * 5 | * 6 |
| * value | * 3 | * 6 | * 12 | * 24 |  |  |  |
| * expression |  |  |  |  |  |  |  |

* 1. Predict the value in steps 4, 5, and 6.
  2. By what factor does the value change . . .
     1. from step 1 to step 3?
     2. from step 3 to step 5?
     3. Conjecture about the factor from step 10 to step 12.
  3. By what factor does the value change . . .
     1. from step 0 to step 3?
     2. from step 2 to step 5?
     3. Conjecture about the factor from step 10 to step 13.

1. Refer to the third table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| * step | * 0 | * 1 | * 2 | * 3 | * 4 | * 5 | * 6 |
| * value | * 2,048 | * 1,024 | * 512 |  |  |  |  |
| * expression |  |  |  |  |  |  |  |

* 1. Predict the value in steps 4, 5, and 6.
  2. By what factor does the value change . . .
     1. from step 1 to step 3?
     2. from step 3 to step 5?
     3. Conjecture about the factor from step 10 to step 12.
  3. By what factor does the value change . . .
     1. from step 0 to step 3?
     2. from step 2 to step 5?
     3. Conjecture about the factor from step 10 to step 13.

### 18.3: Rewriting Expressions

1. For each given expression, decide what to write in the box to create equal expressions.

| * given expression | * equal expression 1 | * equal expression 2 |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. Write at least 3 new expressions that are equal to .



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