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| --- | --- |
| **Rational Exponents (7.2)** | **Math 098** |

Definition: . When *a* is nonnegative, *n* can be any natural number greater than 1. When *a* is negative, *n* must be odd.

Write in radical notation and simplify.

|  |  |  |
| --- | --- | --- |
| 1.
 | 1.
 | 1.
 |

Write with exponential notation.

|  |  |
| --- | --- |
| 1.
 | 1.
 |
|  |  |

Graph  on your calculator.

Definition: (Positive rational exponents) For any natural numbers *m* and *n* () and any real number *a* for which exists, we have that  means  or 

Write in radical notation and simplify

|  |  |
| --- | --- |
| 1.
 | 1.
 |

Definition: (Negative rational exponents) For any rational number  and any nonzero real number *a* for whichexists, we have that  means .

Write with positive exponents and simplify if possible.

|  |  |
| --- | --- |
| 1.

 | 1.
 |
| 1.
 | 1.
 |
|  |  |

Definition: (Laws of exponents) For any real numbers *a* and *b* and any rational exponents *m* and *n* for which , , and  are defined:

|  |  |
| --- | --- |
| 1.
 | In multiplying, add exponents if the bases are the same. |
| 1.
 | In dividing, subtract exponents if the bases are the same. Assume . |
| 1.
 | To raise a power to a power, multiply the exponents. |
| 1.
 | To raise a product to a power, raise each factor to the power and multiply. |

Simplify (answers should have positive exponents)

|  |  |
| --- | --- |
| 1.
 | 1.
 |
|  |  |
| 1.
 | 1.
 |
|  |  |

Method: To simplify radical expressions

1. Convert radical expressions to exponential expressions.
2. Use arithmetic and the laws of exponents to simplify.
3. Convert back to radical notation as needed.

Simplify

|  |  |
| --- | --- |
| 1.
 | 1.
 |
|  |  |
| 1.
 | 1.
 |
|  |  |