Patterns & Algebra Assessment

ACMNA231 – Index Laws

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Teacher Notes

7 8 9 **10** 11 12

TI-Nspire | Assessment | Teacher | Not Applicable

ACMNA231: Simplify algebraic products and quotients using index laws

Introduction

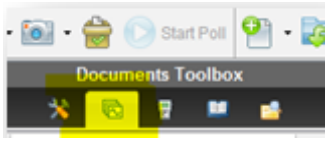
Students are required to apply knowledge of index laws to algebraic terms, and simplifying algebraic expressions using both positive and negative integral indices.
It is assumed that students are familiar with using index notation with numbers to establish the index laws with positive integral indices and the zero index (Year 8, ACMNA182) and simplifying and evaluating numerical expressions, involving both positive and negative integer indices (Year 9, ACMNA209)

The purpose of this document is to provide information about the activity and assessment files included in this bundle. There are four files in total:

- Indices (TI-Nspire file)
- ACMNA231 (TI-Nspire file)
- ACMNA231 Assessment (PDF)
- ACMNA231 Assessment – Answers (PDF)

Index Laws

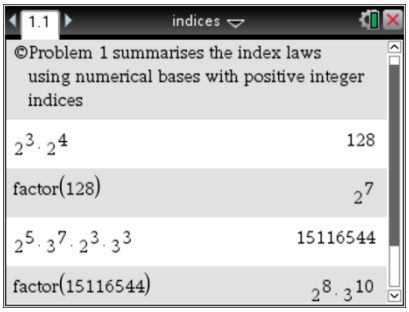
This TI-Nspire file is summary of possible approaches to address the index laws for ACMNA231.
Open the document with the TI-Nspire software. To navigate pages use the page sorter option in the "Documents Toolbox".

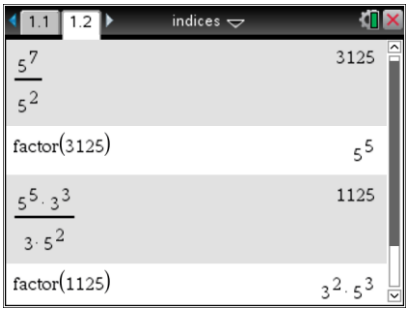


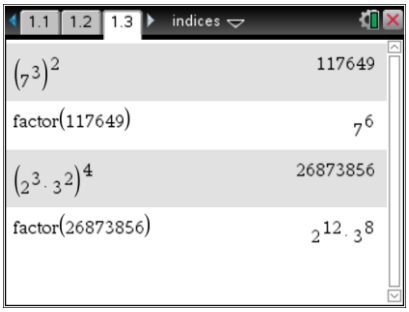
Pages 1.1 – 1.3: Positive indices with numerical bases.
Open a **Calculator** page.

Enter indices using the caret (^) symbol. i.e. 2 ^ 3 for 2^3.

When evaluated, a single numerical value will be displayed. To show this in index notation use **factor**. (menu>**Algebra>Factor**). Note that **factor** will use prime bases only.





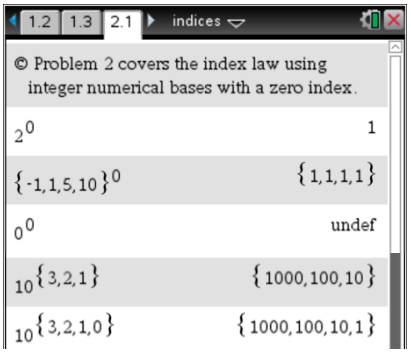


Page 2.1: Zero index with numerical integer bases.

Be *careful* of using the statement that "any numerical value raised to the power of zero equals 1". From the screen it can be seen that 0^0 is not defined.

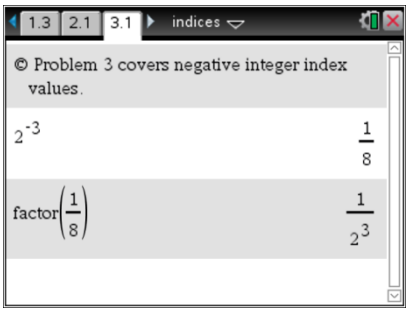
Problem 2 covers the law involving the zero index.

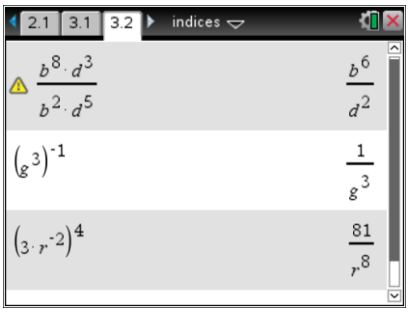
A useful technique for students to conjecture on the value of 10^0 is to use a pattern technique as shown.



Pages 3.1 – 3.2: Negative integer index values.

Problem 3 covers negative integer values.

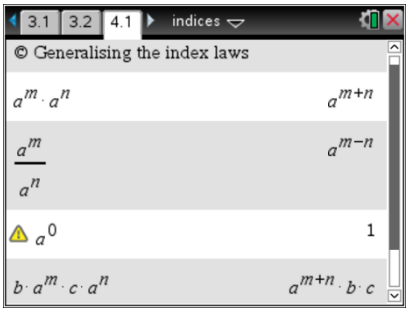




Page 4.1: Generalising the index laws

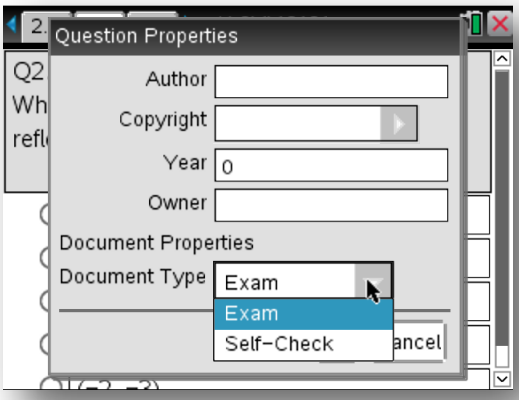
Note that the index law $(a^m)^n$ can only be used if the base has a value , otherwise it will remain in its initial simplified format.

i.e. use $(a^m)^n \mid a = \{1, 2, 3, 10\}$



ACMNA231 – TI-Nspire file

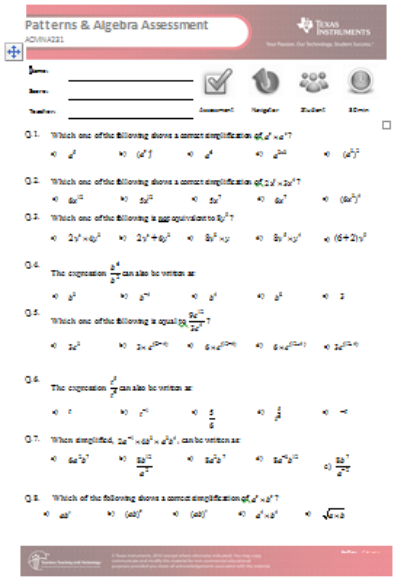
This TI-Nspire file assesses a selection of the content for this curriculum statement. It can be used as formative or summative assessment. The answers are currently set as "Exam" so corrections are completed automatically when the document is collected using the TI-Navigator system.



The questions can be changed to Self-Check and distributed to students. In this case students can see if there answer is correct as soon as they complete the question. The questions are replicated in a print version ACMNA241 Assessment

ACMNA231 – Assessment

This is a PDF containing a printable duplicate of the TI-Nspire file for use in schools where TI-Nspire software, TI-Nspire calculators or TI-Nspire iPad App is not available. The test can be photocopied for non-commercial educational purposes.



ACMNA231 – Assessment Answers

This is a PDF containing a printable duplicate of the TI-Nspire file and includes answers to all the questions.