The KBruch Handbook

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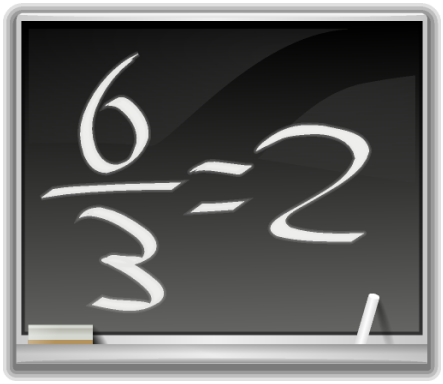

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Abstract

KBruch is a small program to practice calculating with fractions and percentages. Different exercises are provided for this purpose and you can use the learning mode to practice with fractions. The program checks the user's input and gives feedback.

Chapter 1

Introduction

KBruch is a small program to practice calculating with fractions and percentages. Six different exercises are offered as well as a learning mode.

- **Arithmetic** - in this exercise you have to solve a given fraction task. You have to enter the numerator and the denominator. This is the main exercise.
- **Comparison** - in this exercise you have to compare the size of 2 given fractions, using the symbols **>**, **<** or **=**.
- **Conversion** - in this exercise you have to convert a given number into a fraction.
- **Mixed Numbers** - in this exercise you have to convert a mixed number into an improper fraction (ratio) and vice versa.
- **Factorization** - in this exercise you have to factorize a given number into its prime factors.
- **Percentage** - in this exercise you have to calculate percentages.

In each different exercise KBruch will generate a task and the user has to solve it. The program checks the input and gives a feedback about it.

KBruch counts how many tasks were solved at all and how many tasks were solved correctly. The statistics are shown to the user.

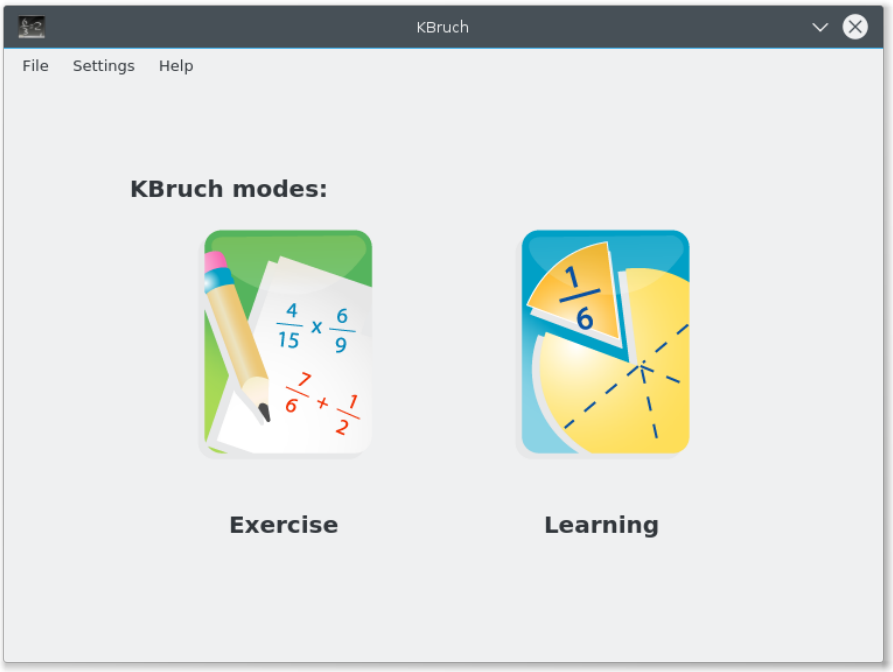
KBruch is very compact and focuses on the core idea of a task generator. An online help system provides context-sensitive help for the different situations.

Chapter 2

Using KBruch

2.1 Choosing the mode: learning or exercises

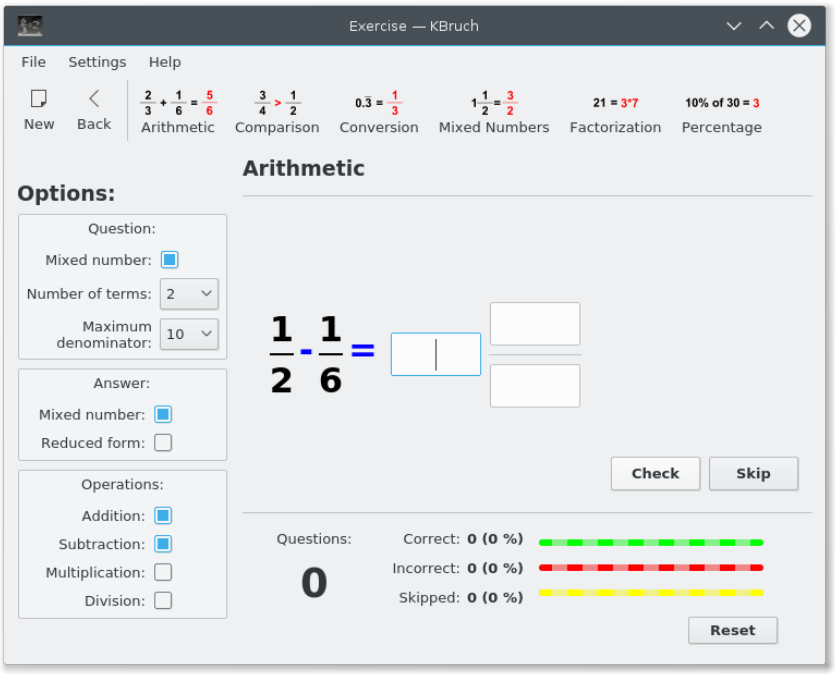
When you start KBruch, it offers you two modes: **Exercise** which is the training mode and **Learning** where you can understand fractions. Clicking one of the pictures will enter the chosen mode. Here is a screenshot of KBruch's mode choices:



Click one of the picture to choose the mode.

2.2 Main Exercise Screen

Here is a screenshot of KBruch's main Exercise screen:



All exercises take place in this screen. This ensures that KBruch is easy to use even for young users! The main screen is separated into 5 parts:

- the menubar with the 3 menus **File**, **Settings** and **Help**
- the toolbar, where you can switch between the different exercises
- the **Options:** on the left, where you can define the difficulty and various settings for the tasks
- the task part, where you have to enter the result of the given task
- the statistical part, where you can see how many tasks have been solved correctly or attempted

At any time, you can go back to Modes using the **Back** icon in the toolbar.

> NOTE
> You can hide the **Options:** section by dragging it to the left.

First you have to choose an exercise in the toolbar. Default is **Arithmetic**. The task part will change according to the chosen task. Some settings in the **Options** section will be enabled, depending on the task you have chosen.

You will find an icon to generate a new task in the toolbar as well. This action is also available in the menu **File** → **New**. This action is always enabled. If you have not solved the currently given task, a new task is generated and the statistics are set back.

If you terminate KBruch the currently chosen exercise will be saved and restored on next startup.

2.3 Statistical Part

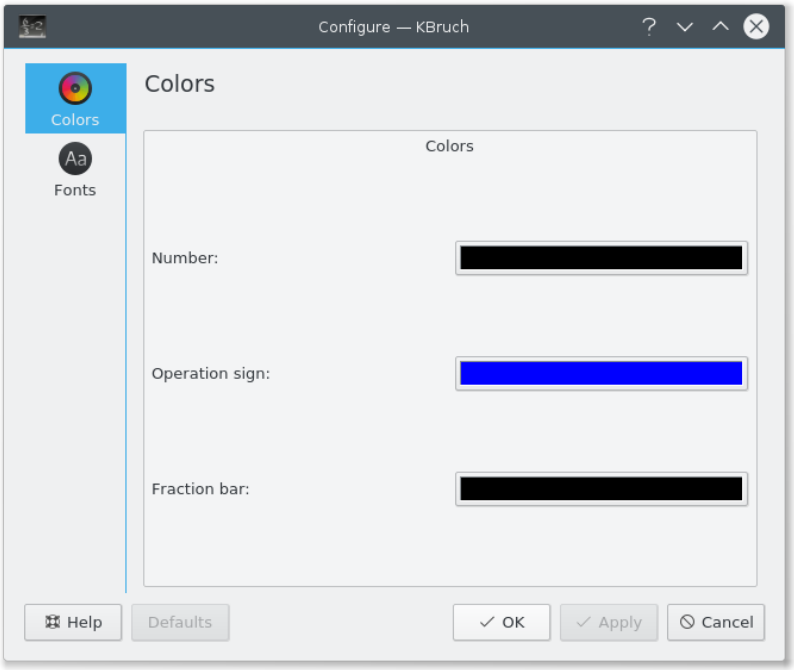
In this part of the main screen you can see:

- on the left, how many tasks have been solved
- on the right, in green, how many tasks have been solved correctly
- on the right, in red, how many tasks have been solved incorrectly
- on the right, in orange, how many tasks have been skipped

You can reset the statistics by clicking on the **New** button in the toolbar or choosing **File** → **New** in the menubar.
The statistics will be saved when KBruch is closed and restored on next startup.

2.4 Configuring KBruch appearance

In this dialog you can adjust some general settings for the task display. To open this dialog use **Settings** → **Configure KBruch...**.

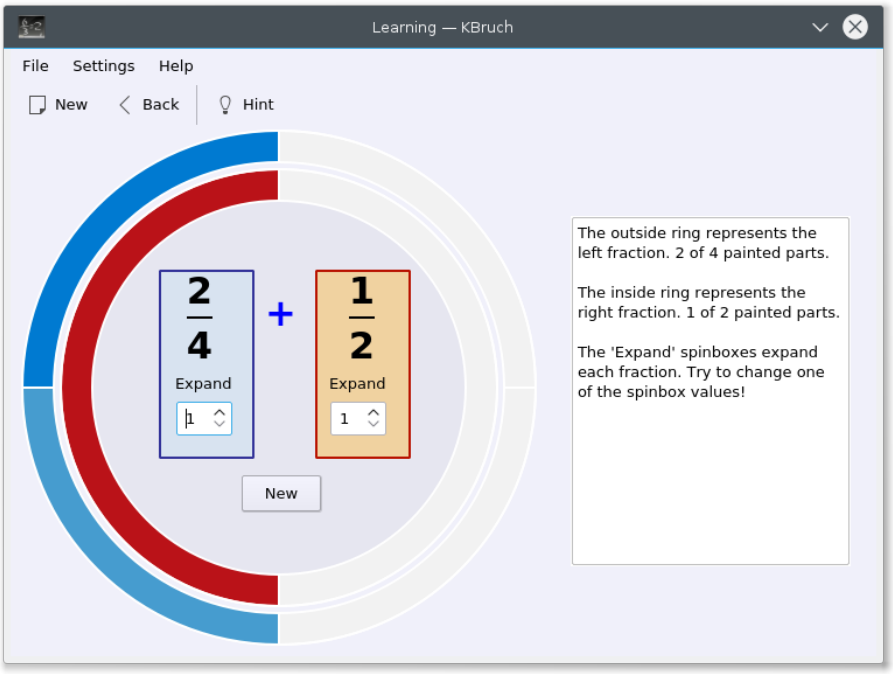


There are two sections to adjust the setting:

- **Colors**: Choose the colors for the different parts of a mathematical expression: numbers, operational sign, fraction bar.
- **Fonts**: Choose a font for displaying the task.

The settings will be saved on KBruch's termination and restored on the next startup.

2.5 Main Learning Screen



Clicking the **Hint** button toggles the display of the help on the right which explains you how the rings work.

Chapter 3

Exercises

3.1 Exercise Arithmetic

In this exercise you have to solve a given task. Therefore you have to enter the integer part of a fraction and the numerator and the denominator. The difficulty of the generated task can be adjusted by using some options on the left.

3.1.1 Options

There are several parameters which influence the difficulty of the generated tasks:

Question:

Mixed number:
Set if the fractions will appear as mixed numbers or not in the question expression (mixed number example: 1 4/5 = 9/5).

Number of terms:
The number of terms (separate fractions) given in each task. From 2 to 5, inclusive.

Maximum denominator:
The highest number KBruch will use as the main denominator in the tasks it sets. From a minimum of 10 to a maximum of 50.

Answer:

Mixed number:
Set if the fractions will appear as mixed numbers or not in the answer (mixed number example: 1 4/5 = 9/5).

Reduced Form:
Check this to force the use of the reduced form.

Operations:

Operations which should be used in the task: **Addition:**, **Subtraction:**, **Multiplication:** or **Division:**. Check all operations you want to use.

After you have changed the parameters you have to click on the **New** button in the toolbar to generate a task which uses the new parameters. You can also call this action from the menubar with **File** → **New**. This will reset the statistics. To avoid that, click the **Next** button to proceed with the changed parameters.

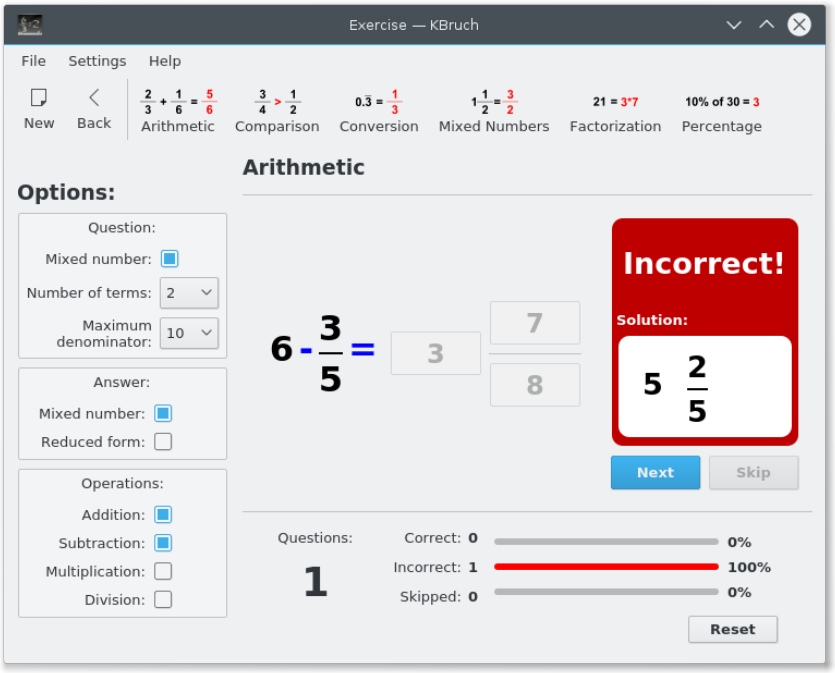
The chosen parameters will be saved on KBruch's termination and restored on next startup.

3.1.2 Solving Tasks

After you have solved a given task, you need to enter the result into the three input boxes. In the left box you enter the integer part of the fraction, in the upper box the numerator and in the lower box the denominator. If the option **Mixed number:** in the **Answer:** section is unchecked, the left box for the integer part of the fraction is hidden. Then you use only the numerator box and the denominator box for your input.

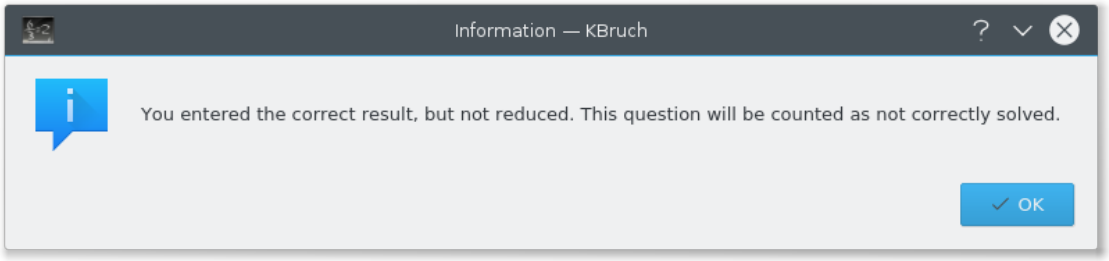
If the result is negative, you can enter a minus sign in front of the numerator or denominator. If the result is 0, just type a 0 in the numerator input field. If the result has a denominator of 1, you can leave the lower box empty.

After you have entered the result you should click the **Check** button below the input boxes. KBruch will check your input and present the correct result on the right below the **Incorrect!** string:



This task was solved incorrectly. The correct value is shown in 2 different forms: normal (reduced) and mixed number.

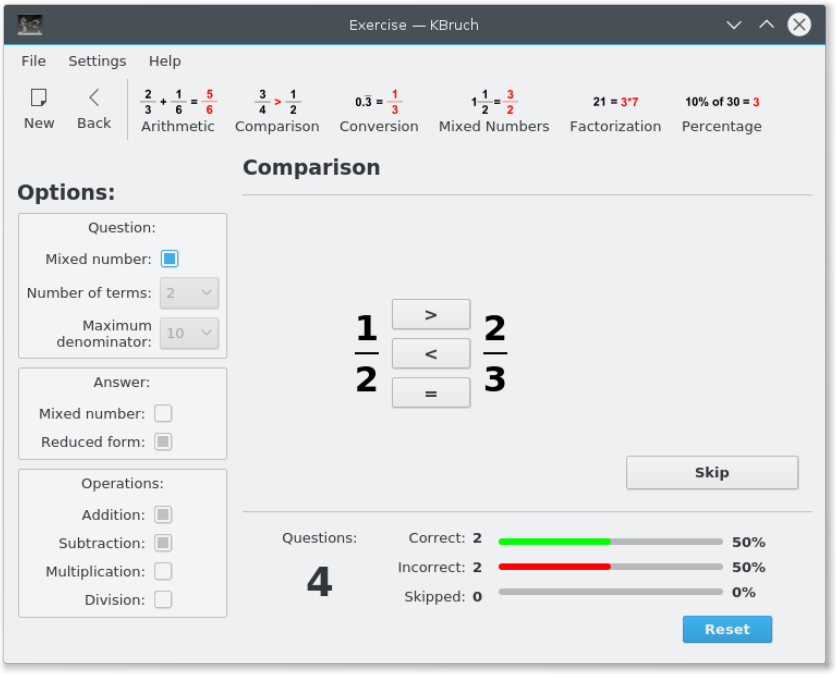
> NOTE
> If you checked the **Reduced form:** in the Options in the **Answers:** section then you always have to enter the result reduced. KBruch will show you a short message like the one in the screenshot below, if you enter the correct result unreduced. The answer will then be counted as incorrect.



To continue with the next task, click on the **Next** button. If you want to change the parameters for the next task please do this before clicking on the **Next** button.

3.2 Exercise Comparison

In this exercise you have to compare 2 given fractions. You have to choose the bigger fraction of both by selecting the correct comparison sign.

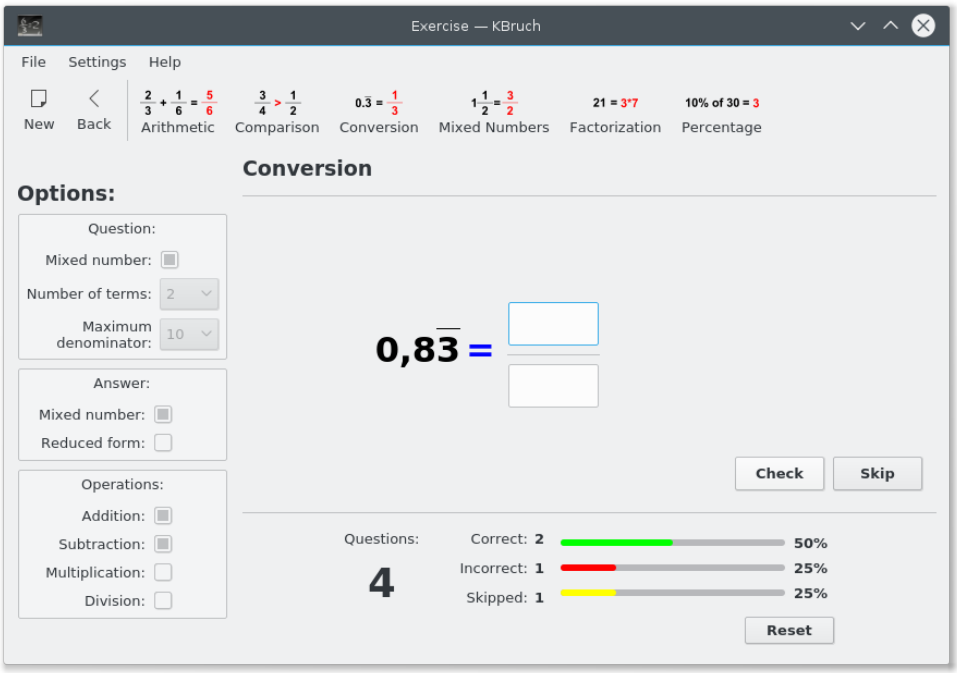


First choose the correct comparison sign. After you have chosen the comparison sign, the result will show on the right. A green square with **Correct!** will tell you that your answer was correct while a red square with **Incorrect!** will indicate that your answer was wrong. You will get to the next task by clicking the **Next** button.

In this exercise only the option **Mixed number:** is enabled. If checked the fractions will appear as mixed numbers.

3.3 Exercise Conversion

In this exercise you have to convert a given number into a fraction. You have to enter numerator and denominator.



On the left side of the equal sign in the screenshot above you can see a recurring decimal. This means, that the fraction shown as a decimal has a repeating part. The repeating part is marked with the small bar above the numbers. Those numbers repeat ad infinitum.

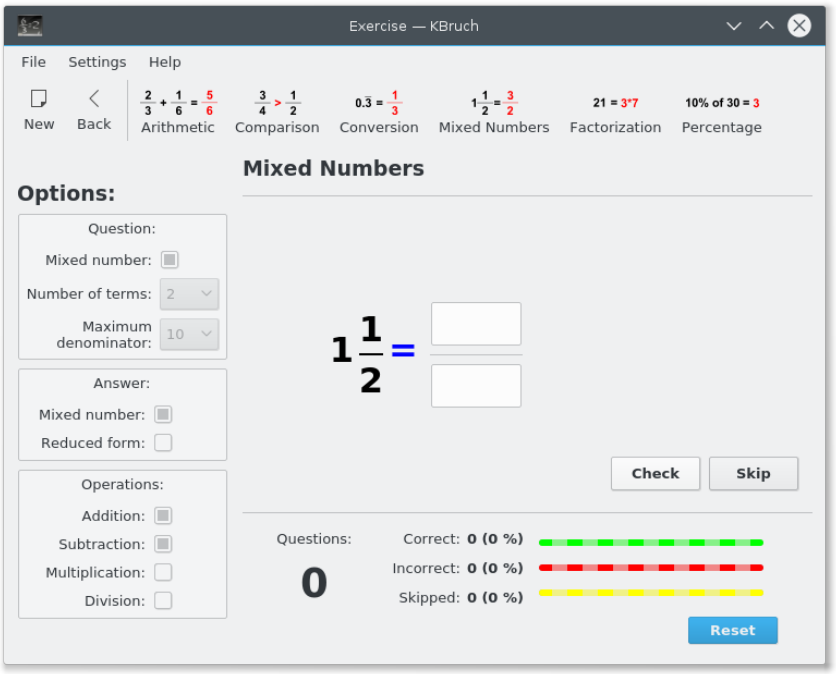
After you have entered the numerator and denominator click on the **Check** button. KBruch will check your input and present the correct result. After this step you will get to the next task by clicking on the **Next** button.

> NOTE
> Do not forget to enter the result reduced. Unreduced results will be counted as solved not correctly.

In this exercise all options are disabled.

3.4 Exercise Mixed Numbers

In this exercise you have to convert a given mixed number into an improper fraction (ratio) and vice versa. You have to enter numerator and denominator for improper fraction or a whole number, numerator and denominator for mixed number.



On the left side of the equal sign in the screenshot above you can see a mixed number. This means, that the number is made up of a whole number and a proper fraction. You should enter the equal improper fraction (the numerator part of such fraction is greater or equal to the denominator part).

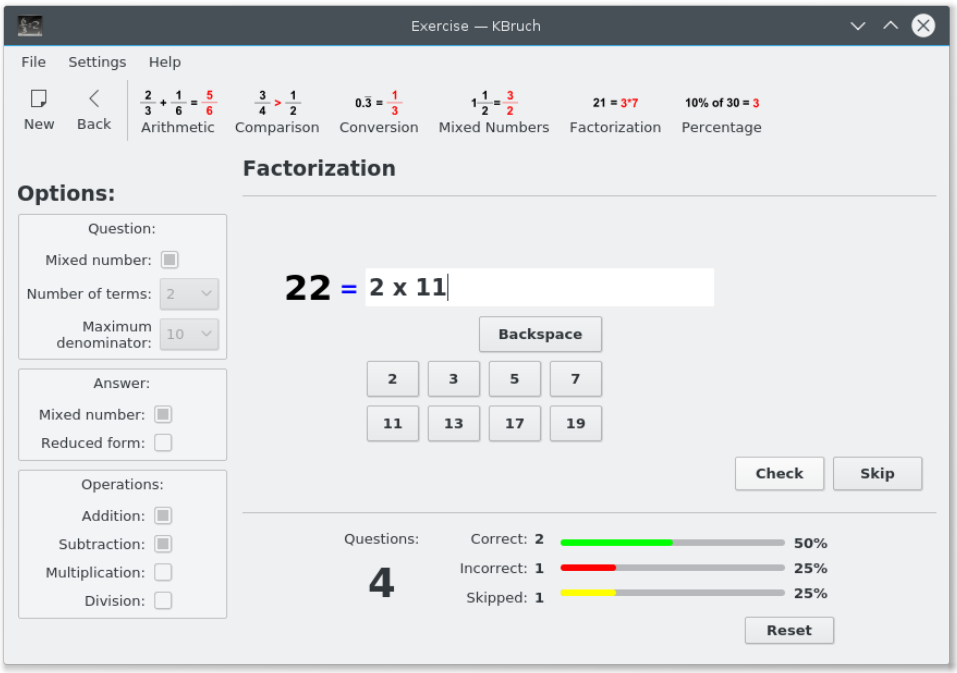
After you have entered the numerator and denominator click on the **Check** button. KBruch will check your input and present the correct result. After this step you will get to the next task by clicking on the **Next** button.

> NOTE
> Do not forget to enter the result reduced. Unreduced results will be counted as solved not correctly.

In this exercise all options are disabled.

3.5 Exercise Factorization

In this exercise you have to factorize a given number into its prime factors. You have to enter all prime factors of the number.



You can enter a factor by clicking on the prime factor buttons. The 'x' sign is automatically inserted, when you click the next prime factor button. You can remove the last entered prime factor by clicking on the **Backspace** button.

After you have entered all prime factors click on the **Check** button. KBruch will check your input and present the correct result. After this step you will get to the next task by clicking on the **Next** button.

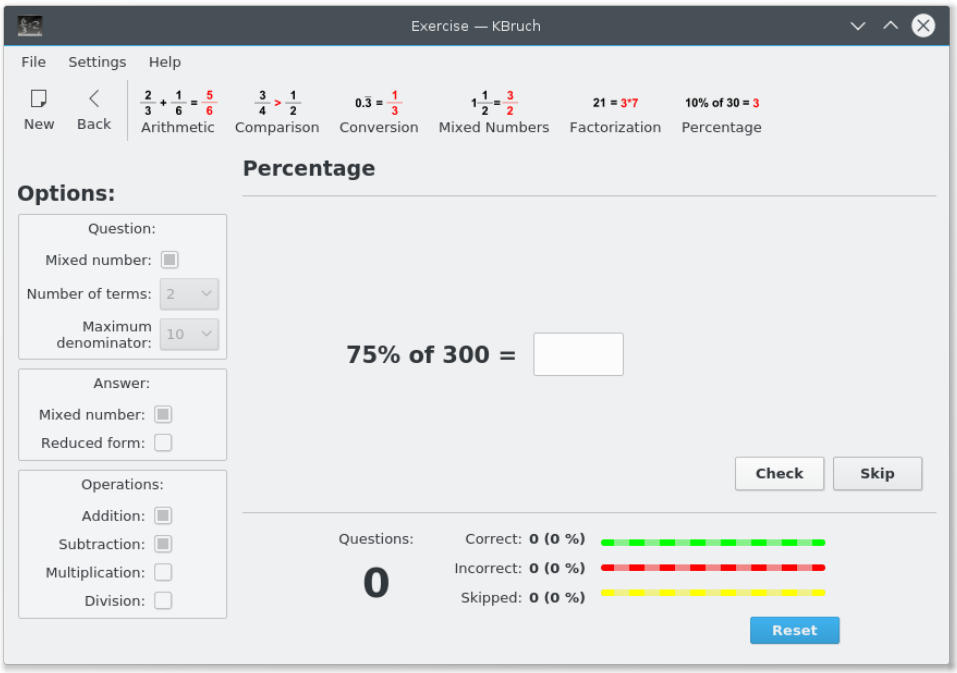
In the screenshot at the top of this page you can see a 'x' between the prime factors. This is the multiplication sign. The product of all prime factors must be the number you try to factorize.

> NOTE
> You have to enter all prime factors even when a prime factor repeats several times. Example: As prime factors of number 18 you have to enter 2, 3 and 3.

In this exercise all options are disabled.

3.6 Exercise Percentage

In this exercise you have to answer some percentage questions.



After you have entered your answer click on the **Check** button. KBruch will check your input and present the correct result. After this step you will get to the next task by clicking on the **Next** button.

In this exercise all options are disabled.

Chapter 4

Credits and License

KBruch
Program and documentation Copyright: 2001-2011 Sebastian Stein seb.kde@hpfsc.de
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