Checking Equivalence
Student Activity

Name _____

Class _____

Activity Overview

This activity uses mathematical properties to explore equivalent expressions. The lesson uses the Calculator application to verify equivalence with fractions, decimals, factors, exponents, and order of operations.

Materials

- *Technology needed (TI-Nspire™ handheld, computer software)*

Part 1—Using Notes

Step 1: Preparing the title page and naming the document

1. Press ⌂ on **> New Document > Add Notes**.
2. Type: Checking Equivalence.
3. Press enter.

NOTE: To obtain capital letters, use the ⇧shift key.

4. Press doc▾ **> File > Save As…**.
5. Type Checking_Equivalence enter.

NOTE: To obtain the underscore, _, press ctrl ␣ .
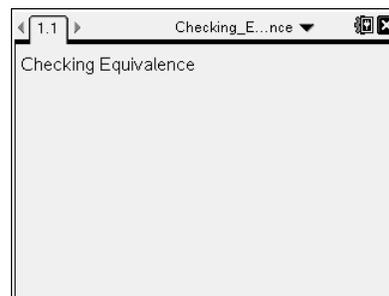
Step 2: Decimals and Fractions

1. To insert a new page, press ⌈ctrl⌉ ⌈doc▾⌉ **> Add Calculator**.

2. Enter the decimal value 0.725 onto the calculator page and press ⌈enter⌉.

    The output is the same decimal that you entered.

3. To recall your entry and copy it to the entry line, press ▲ ▲ ⌈enter⌉ **.**

4. To convert to a fraction, select **Menu > Number > Approximate to Fraction**, and press ⌈enter⌉ to see the result.
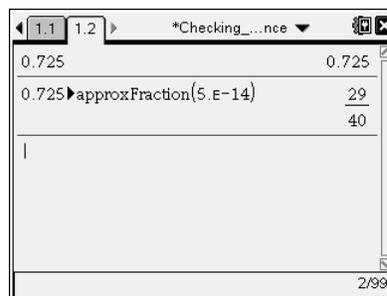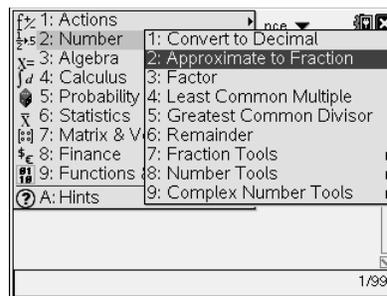
Step 3: Checking for Equivalence

To copy the decimal and set it equal to the fraction to confirm their equivalence:

To recall 0.725, press ▲ ▲ ▲ ▲ ⌈enter⌉.

Press ⌈=⌉, then press ▲ ⌈enter⌉. Finally press ⌈enter⌉ again to see if the equation is true or false.
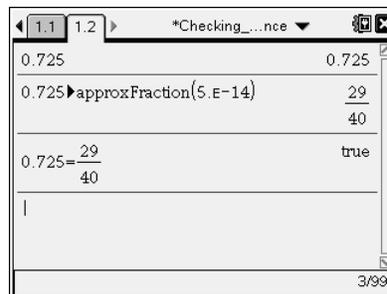
Step 4: Other Fractions That Are Equivalent?

1. Another fraction that is equivalent to $\frac{29}{40}$ is $\frac{58}{80}$.

2. Type $\frac{29}{40} = \frac{58}{80}$ by pressing ⌈ctrl⌉ ⌈÷⌉ > 29 > ⌈tab⌉ > 40 > ⌈tab⌉ ⌈=⌉ ⌈ctrl⌉ ⌈÷⌉ > 58 > ⌈tab⌉ > 80 > ⌈enter⌉ to see it is true.

3. What is one way to obtain $\frac{58}{80}$ from $\frac{29}{40}$?

4. Find two other fractions that are equivalent to 0.725 and test the truth value.
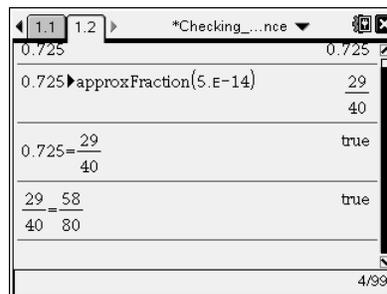
Answer these questions.

Insert a new calculator page: Press $\boxed{\text{ctrl}}$ $\boxed{\text{doc}\blacktriangledown}$ **> Add Calculator**.

5. Use the process from above to convert the following to fractions. Find two other equivalent fractions and test the truth value in the calculator application.

0.875	2.8	(0.56 · 8.456)

6. Perform the following operations with fractions, and then find both a decimal and a fraction that are equivalent to your result.

$\dfrac{3}{8} + \dfrac{5}{7}$	$\dfrac{2}{3+6} - 9$	$-\dfrac{18}{40} + \left(-\dfrac{12}{20}\right)$

7. Mike tried to find an expression equivalent to $\dfrac{71}{60}$.

Correct his work so that the equivalence is true.
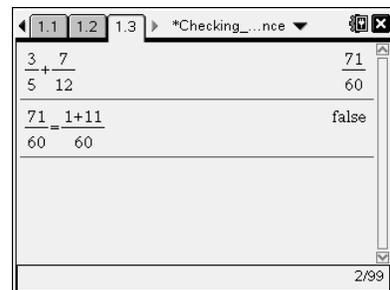
Prior to starting Part 2: Insert a new calculator page: Press press ctrl doc▾ > **Add Calculator.**

Part 2—Prime Factorization

Use the Factor Menu to find the prime factorization of a number.

1. Select **Menu > Number > Factor** (or you can type the word **factor**).
2. Find the factors of 10050 by entering **factor(10050).** This command gives the prime factorization of the number.
3. Find an expression that is equivalent to the prime factorization. Then check it.
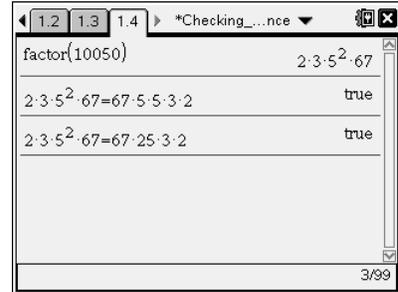
Answer this question.

4. Complete the table below. Use the Calculator application to check your equivalent expressions.

Value	360	10890	36549
Prime Factorization			
Equivalent Expression			

Part 3—Exponents

Answer these questions.

5. Predict the value of each of the following. Create an equivalent expression, and test it.

a. -3^2 _____   b. $(-3)^2$ _____   c. $-(-3)^2$ _____

Explain your results: _____

_____

6. Simplify each of the following without using the calculator application. Leave the result in exponential form. Check each of the simplifications and rewrite as another true statement.

a. $5^3 \cdot 5^7$

b. $(5^2 + 5^5)^2$

c. $(5^2)^4$

d. $\dfrac{5^6}{5^8}$

_____   _____   _____   _____

Part 4—Order of Operations

➤ **Answer this question.**

7. Are the following equal? If not, change the **right-hand** side of the equation to create true statements.

a. $4+3(6) = 7(6)$

b. $24 \div 6 \cdot 2 = 24 \div 12$

c. $-3 \cdot 36 - (-3) \cdot 54 = -3 (36 + 54)$

_____   _____   _____