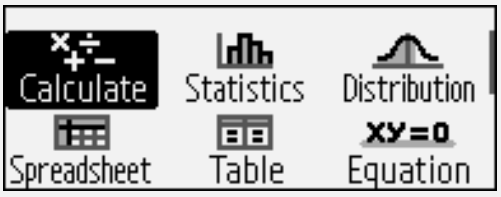
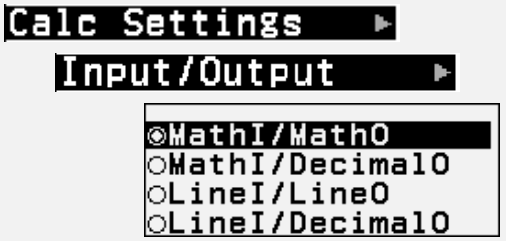
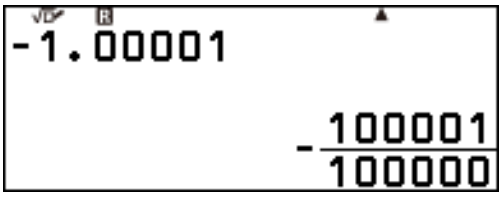
Unit 8: Lesson 16 – Decimal Representations of Rationals

Activity 16.2: Rational Numbers as Fractions

Skill: Use the Calculate app to convert rational numbers from decimals to fractions.

Activity Summary:
This activity focuses on rational numbers and their various representations, particularly converting between terminating decimals and fractions. Students will learn that rational numbers can always be expressed as a fraction of integers. The activity also addresses a common misconception by including examples of square and cube roots that are, in fact, rational numbers, rather than irrational numbers. The Calculate app on the calculator can be used to convert a rational number from decimal form to that of a fraction.

1. Turn on the calculator with the ⏻ **- On** button. Press ⌂ **– Home** and then use the arrows to highlight the **Calculate app**.	
2. Press either OK or EXE to open the **Calculate app**.	
3. To have answers as **fractions in simplest form**, the calculator must be in **MathI/MathO mode**. This is the default setting. To check, press ☰ **– Settings** then press either ▷, OK, or EXE twice. The top option should be selected.	
4. Press the AC **button** to return to the **Calculate app**.	
5. Enter the first decimal number, **0.2**, and press either OK or EXE to convert to the fraction $\frac{1}{5}$.	

6. Enter the second number, $-\sqrt{4}$, and press either (OK) or (EXE). Since the result is an **integer**, the **simplest form** is not a fraction.	
7. However, the integer -2 can be written as the fraction $\frac{-2}{1}$. To verify, enter the fraction into the calculator and press either (OK) or (EXE).	
8. Enter the third number, **0.333**, and press either (OK) or (EXE) to convert to the fraction $\frac{333}{1000}$.	
9. The next number is a **cube root**. Some students may believe that all roots are **irrational**. To enter a **cube root**, first enter the index, **3**, then press (↑) (√), for ($\sqrt[\square]{\square}$) followed by the number for the **radicand**. Since **1000** is a **perfect cube**, the answer will show in simplest form as the **whole number 10**. This can be written as $\frac{10}{1}$.	
10. The next **decimal**, **-1.000001** will still display as a **decimal**. However, decimals up to the **hundred-thousandth place** will be written as a **fraction**. For example, **-1.00001** is displayed as **fraction** $-\frac{100001}{100000}$.	
11. The last number given, $\sqrt{\frac{1}{16}}$, can be entered by pressing (√) followed by (▤). Enter **1** for the **numerator**, press the **down arrow**, (▽), and then enter **16** for the **denominator**. Press either (OK) or (EXE) to convert to the fraction $\frac{1}{4}$.