Name: _____   Date: _____

Calculator Keys

You can use your calculator to perform complex calculations more easily. Never throw out the manual for your calculator! If you do lose it, you can go online to the manufacturer's web site and download a copy.

Many students are unaware of, or have forgotten, how to use their calculator effectively. Here is a summary of some important keys on your calculator. Keep in mind that different calculators work differently, so use your calculator's manual as your main reference.

Storage Keys

When handling multiple calculations, use the calculator's storage key(s) to recall complex numbers instead of writing them down. You are susceptible to making mistakes when you write down every number after each operation. Different calculators handle this function in different ways. One way is the answer key, $\boxed{\text{ANS}}$. Another way is the memory keys. Which way does your calculator store numbers?

- **Answer Key**
  $\boxed{\text{ANS}}$ is useful for complicated calculations. The calculator stores the last number entered, including the result of a set of calculations.

  Example
  Determine the value of $\dfrac{0.03}{1+0.0225}$.

  Solution
  One way to solve this expression is to input it entirely into your calculator, using brackets. For example:
  $.03 \boxed{\div} \boxed{(} 1 \boxed{+} .0225 \boxed{)}$
  Alternatively, you can calculate the value of the denominator first:
  $1 \boxed{+} .0225$
  Then, type in
  $.03 \boxed{\div} \boxed{\text{ANS}}$.
  The value of $\dfrac{0.03}{1+0.0225}$ is $0.29339853...$.

- **Memory Keys**
  Identify keys on your calculator such as $\boxed{\text{STO}}$ and $\boxed{\text{RCL}}$. $\boxed{\text{STO}}$ allows you to store numbers. Follow the colour coding on the calculator. If $\boxed{\text{STO}}$ is green, locate keys in green such as A, B, etc. To reclaim the stored number, press $\boxed{\text{RCL}}$ and the key that identifies its location.

  > The memory keys on your calculator may work differently. Refer to your calculator manual.

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Question

1. Use the storage keys on your calculator to solve each expression. Give each answer to three decimal places.

a) $\dfrac{317.1 - 25.3}{278.5} - \dfrac{0.922^3}{(3.64)(0.107)}$

b) $\dfrac{(3.416)(65)^2}{\sqrt{0.1598} + 2.773}$

c) $\dfrac{1}{0.340\ 68} + \dfrac{37\ 442}{29.61^2}$

d) $37.1 - (15.92)(1.68)^3$

Reciprocal Keys

When working with unit fractions, you can use the reciprocal key, $\boxed{1/x}$ or $\boxed{x^{-1}}$.

Example 1
Use the reciprocal key on your calculator to show the reciprocal of 7.

Solution
Use the following key sequence:
$7\ \boxed{1/x}$ or $7\ \boxed{x^{-1}}$

Example 2
Determine the value of $\dfrac{1}{(1+0.035)^6}$.

Solution
Instead of typing in the entire expression, determine the value of the denominator and then press the $\boxed{1/x}$ key. Alternatively, raise the sum (1 + 0.035) to the exponent –6.

The value of $\dfrac{1}{(1+0.035)^6}$ is 0.813500644... .

Fraction Keys

The fraction key is useful when adding, subtracting, multiplying, dividing, and writing fractions in lowest terms. It can work with mixed numbers and improper fractions. Look for this key on your calculator: $\boxed{a/b}$, $\boxed{A\ b/c}$, or something similar. Note what happens when you use the second-function key, $\boxed{2nd}$, or shift key, $\boxed{SHIFT}$, with the fraction key.

Example

On your calculator, show the mixed number $3\frac{7}{8}$ as an improper number.

Solution

Key $3\frac{7}{8}$ into your calculator using the following key sequence:

3 |A b/c| 7 |A b/c| 8

The calculator screen will show 3 ⌐ 7 ⌐ 8.

To convert this number to an improper fraction, key in |2nd| |A b/c| or |SHIFT| |a/b|.

The calculator screen will display 31 / 8.

> Your calculator may
> appear or work
> differently. Refer to your
> calculator manual.

Question

2. Perform the following operations on fractions using the fraction key on your calculator.

a) $3\frac{9}{16}+4\frac{7}{12}+\frac{1}{6}$

b) $18\frac{3}{4}-5\frac{4}{5}$

c) $16\frac{1}{6}\times3\frac{5}{9}$

d) $\frac{137}{15}\times\frac{25}{12}$

e) $\frac{5}{3}\div\frac{1}{10}$

f) $\frac{2}{3}+\left(\frac{2}{3}\right)^2-\frac{5}{6}$

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Trigonometric and Inverse Trigonometric Keys

Your calculator has the keys to perform trigonometric calculations. These keys are |SIN|, |COS|, and |TAN|. Recall that a trigonometric operation is performed on an angle. Your calculator may require you to enter the angle into your calculator either before or after the trigonometric key.

To determine the inverse trigonometric function, use the second-function key or shift key in addition to the appropriate trigonometric key. The inverse trigonometric keys are |SIN⁻¹|, |COS⁻¹|, and |TAN⁻¹|.

> Note that |SIN⁻¹|,
> |COS⁻¹|, and |TAN⁻¹|
> are inverse keys, not
> reciprocal keys.

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Logarithm Keys for Common Logarithms

You can use the logarithm key, $\boxed{\text{LOG}}$, to perform calculations for common (base 10) logarithms. A calculator cannot make direct calculations in other bases. To calculate in bases other than 10, use the logarithm conversion formula: $\log_b m = \dfrac{\log m}{\log b}$, where $b > 0$, $b \neq 1$, $m > 0$.

Questions

3. a) Which logarithm do you think has a greater value, log 260 or $\log_3$ 260? Why?
   b) Use your calculator to determine the value of each logarithm. Was your prediction correct?

4. a) Which logarithm do you think has a greater value, $\log_5$ 76 or log 76? Why?
   b) Use your calculator to determine the value of each logarithm. Was your prediction correct?

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Using π on Your Calculator

When using a calculator to perform calculations with the irrational number pi, always use the calculator key $\boxed{\pi}$. Do not use 3.14, $\dfrac{22}{7}$, or any other approximation of π. When you press $\boxed{\pi}$, your calculator will display the symbol π, or it will display π to the number of decimal places that will fit on the screen, such as 3.141 592 654.

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Exponent Keys for Powers Other Than 2

Your calculator can perform the square function, $\boxed{x^2}$, and the square root function, $\boxed{\sqrt{x}}$ or $\boxed{\sqrt{}}$. To raise a number to an exponent other than 2, calculators have an exponent key: $\boxed{y^x}$, $\boxed{x^y}$, or $\boxed{\wedge}$. For example, to calculate 11^4, key in 11 $\boxed{x^y}$ 4. To determine a root other than the square root or cube root, calculators have a root key: $\boxed{\sqrt[x]{}}$.

> Some calculators also have a key to perform the cube function, $\boxed{x^3}$, and the cube root function, $\boxed{\sqrt[3]{x}}$.

When a negative number is raised to an exponent, note whether or not you have to insert brackets around the number before the exponent function is applied.

Example
Use your calculator to simplify each expression. Express the answer as a fraction, where appropriate.

a) 3^4

b) $(-7)^6$

c) -7^6

d) $\left(\dfrac{1}{2}\right)^3$

e) 4^{-5}

f) $\sqrt{121}$

g) $\sqrt[3]{343}$

Solution
a) Use the following key sequence: 3 $\boxed{x^y}$ 4. The calculator screen will display an answer
of 81.

b) Use the following key sequence: (−7) $\boxed{x^y}$ 6. The calculator screen
will display an answer of 117649.

Why are the
answers for parts b)
and c) different?

c) Use the following key sequence: −7 $\boxed{x^y}$ 6. The calculator screen will
display an answer of −117649.

d) Use the following key sequence: 1 $\boxed{A\,b/c}$ 2 $\boxed{x^y}$ 3. If your calculator can perform the cube
function, use the following key sequence: 1 $\boxed{A\,b/c}$ 2 $\boxed{x^3}$. The calculator screen will
display an answer of 1 / 8.

e) Use the following key sequence to determine 4^5: 4 $\boxed{x^y}$ 5. The calculator screen will display
an answer of 1024. The answer is the reciprocal: $\dfrac{1}{1024}$.

f) Use the following key sequence: 121 $\boxed{2nd}$ $\boxed{\sqrt{x}}$. The calculator
screen will display an answer of 11. Notice that the answer given
is the *principal* root, which means that the answer is positive, even
though there are actually two possible answers, +11 and −11. Both
numbers, when raised to the exponent 2, result in 121:
$(+11)^2 = 121$ and $(−11)^2 = 121$

On some calculators,
you may need to use a
different key sequence.
Refer to your
calculator manual.

g) Use the following key sequence: 3 $\boxed{2nd}$ $\boxed{\sqrt[x]{\ }}$ 343. If your
calculator can perform the cube root function, use the following
key sequence: 343 $\boxed{2nd}$ $\boxed{\sqrt[3]{x}}$. The calculator screen will display
an answer of 7.

Questions
5. Why is there no principal root in part g) of the Example?

6. Simplify each expression. Express the answer as a fraction, where appropriate.

a) 4^3

b) $−4^3$

c) $(−4)^3$

d) $\sqrt[3]{125}$

e) $\left(\dfrac{7}{3}\right)^{-3}$

f) $−9^{-2}$