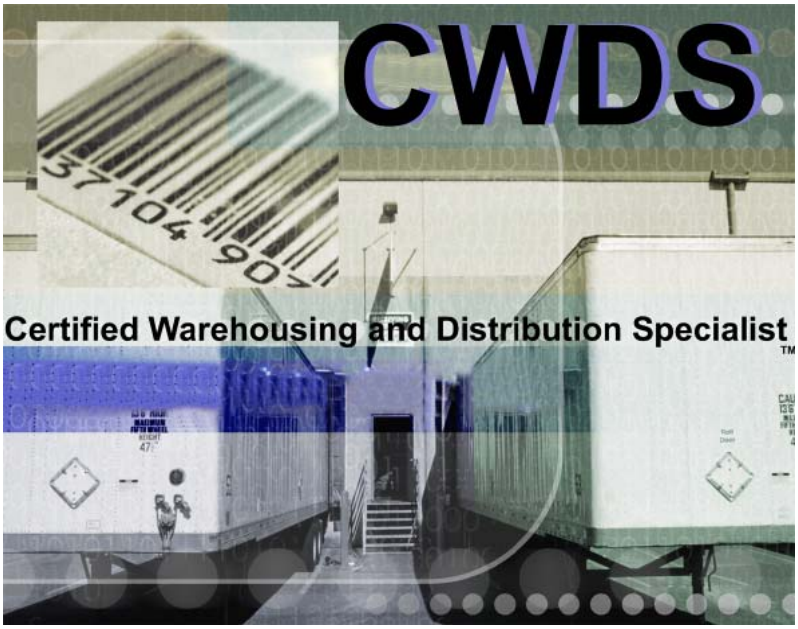


# Calculators

QUICKSTART®
TECHNICAL COLLEGE SYSTEM OF GEORGIA




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# Introduction

## Overview

Every day, people use different tools to make work easier and faster. One useful tool is the hand-held calculator. Using the calculator, you can quickly get correct answers to difficult or lengthy problems.

In this unit, you will learn to use a calculator. You will work with whole numbers, fractions, mixed numbers and decimal numbers. You will learn the terms for the working parts of the typical hand-held calculator and the functions of many of the keys. You will also learn how to interpret the results displayed by the calculator.

## Objectives

The information, activities and practice provided during this unit will enable you to use a calculator to:

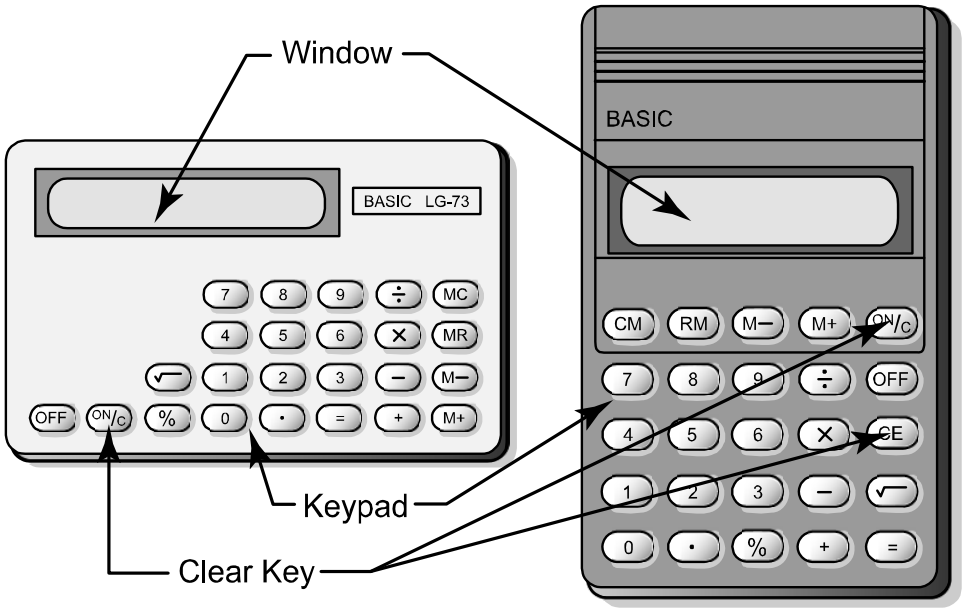
1. Add, subtract, multiply and divide whole numbers.
2. Add, subtract, multiply and divide decimal numbers.
3. Add, subtract, multiply and divide fractions.
4. Solve multistep computations.
5. Calculate percentages.
6. Use the calculator to square numbers.
7. Find the square root of a number.

## Notes:


# Getting to Know the Calculator

## Introduction

A basic calculator is used to add, subtract, multiply and divide.




*Two Kinds of Basic Calculators*

Although there are many kinds of basic calculators, all of them have certain features in common. Though they may differ somewhat in appearance, they basically all work the same way. Each has a window that allows you to view data and a numeric key pad. There is a key for each basic mathematical procedure — addition (+), subtraction (–), multiplication (×) and division (÷). A basic calculator also has a key with an equal sign on it and a clear key.

The first step in using a calculator is to turn it ON. Some calculators have a key marked Power, some have a key marked ON and some have a key marked ON/C.

When the calculator is ON and ready to use, you will see a zero (0) in the window. If there is no zero in the window, you must clear the window.

Most calculators have more than one key for clearing the window. A common one is labeled CA (Clear All) or AC (All Clear). Others are labeled C, AC/ON, ON/C, or CE/C.

## The CA Key

The CA (or AC) key clears everything. Pressing it is like completely erasing a chalkboard.

## The C Key

The C key clears everything except what you have stored in memory, a storage place for a number you want to use later. Pressing the C key is like erasing the whole chalkboard except a small notice that is labeled "Do Not Erase."

## The CE Key

The CE key clears only the last entry that you made. Pressing the CE key is like erasing only the last number you wrote on the chalkboard. It is used to clear errors you make when you are keying in a calculation.

Practice with the calculator will help you learn how to use it.




## Progress Check #1

1. The basic calculator is used to _____, _____ _____ and _____.

2. Place the letter of the correct calculator key in column one in the blank beside its definition in column two.

| | | | |
|---|---|---|---|
| a. | C | _____ | clears everything in calculator |
| b. | – | _____ | divide |
| c. | ON, POWER, ON/C | _____ | clears only the last entry |
| d. | + | _____ | multiply |
| e. | CA or AC | _____ | clears everything, except memory |
| f. | × | _____ | subtract |
| g. | CE | _____ | turns calculator on |
| h. | ÷ | _____ | add |

3. You view answers in the _____ of the calculator.

## Notes:


# Whole Numbers and the Calculator

Working with whole numbers on a calculator is easy. There are several basic principles to remember. The principles are different depending on the operation you perform. Remember that a whole number is a digit from 0 to 9 or a combination of digits, like 1,091. Whole numbers are numbers with no fractional parts—7, 16, 143 and 1,972, for example.

## Addition and Multiplication

Adding or multiplying whole numbers is really just a matter of keying in the correct numbers and sign. Remember, the order in which you enter the numbers makes no difference when adding or multiplying.

### Sample Problem

You are fabricating a large frame for a production area. The material to be used is 4 inch square steel tubing. You have the lengths of all major pieces.

| | |
|---|---|
| Upper and lower sides | 128 ft. |
| Vertical pieces | 48 ft. |
| Lateral pieces | 40 ft. |
| Long diagonals | 66 ft. |
| Short diagonals | 22 ft. |

Find the total length of steel necessary.

### *Procedure*

**Step 1:** Turn the calculator ON.

**Step 2:** Clear the window by pressing CA.

**Step 3:** Key in each number. Since this is an addition problem, it makes no difference in what order you key in the numbers. Just be sure to press the addition key (+) between each entry.

**Step 4:** Press the equal key (=) after you have entered all the numbers. The calculator adds the entries automatically, giving you a total after each entry.

### *Solution*

The total length of steel needed is 304 feet.

Now, use your calculator to solve a multiplication problem.




## Sample Problem

A division of a company makes all equipment purchases over $1,000 for its nine plants, taking advantage of large-lot price breaks. The division purchasing agent recently ordered new welding machines at $1,300 for each of the nine plants. Calculate the total amount of the purchase.

### *Procedure*

**Step 1:** Clear the window.

**Step 2:** Key in 1,300.

**Step 3:** Now, touch the multiplication key (×).

**Step 4:** Now touch the 9 key. Since this is a multiplication problem, you can key in the numbers in any order. Be sure that you touch the multiplication key (×) between touching the numbers you want to multiply.

**Step 5:** Press the equal key (=) to get the product of the two numbers. 1,300 × 9 = 11,700

### *Solution*

The total amount of the purchase is $11,700.

## Subtraction and Division

In subtraction and division, the order in which you key in the data is very important. For example, if you key in 45 divided by 5 (45 ÷ 5) you will get the answer 9. If you key in 5 ÷ 45, you will get the answer 0.11111111. As you can see, there is a big difference between the two answers.

### Sample Problem

Dave went to the hardware store to buy a space heater for his work area. He has $120 with him. He has to pay his $52 water bill. The heater he wants costs $78. Calculate whether he can buy the heater and pay his water bill.

#### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Enter the total amount of money Dave has with him today, $120.

**Step 3:** Press the minus sign (–) and enter the amount of the water bill, $52.

**Step 4:** Press the equal sign (=) to get an answer: $120 – $52 = $68. Dave has $68 left after paying the water bill.

#### *Solution*

Dave will not be able to buy the heater and pay his bill.

Now use your calculator to solve a division problem. Remember, you must key in the numbers in the proper order.




## Sample Problem

Chuck is an independent contractor. His total weekly earnings for a six month period came to $12,650. He worked 20 weeks. He wants to calculate his average weekly take-home pay for that period.

### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in the total amount of earnings, $12,650.

**Step 3:** Press the division key (÷). Then key in the number of weeks he worked, 20.

**Step 4:** Press the equal sign (=). $12,650 ÷ 20 = $632.50. (Window will show 632.5.)

### *Solution*

Chuck's average weekly take-home pay for the six month period was $632.50.

## Progress Check #2

Use your calculator to work the following problems.

1. 894 – 684 = _____

2. 5,475 ÷ 400 = _____

3. 798 – 499 = _____

4. 953 ÷ 21 = _____

5. 23,541 – 14,699 = _____

6. 423,657 ÷ 12,756 = _____

7. 324 × 109 = _____

8. 283 + 89 = _____

9. 34 × 684 = _____

10. 16 × 45,739 = _____

11. 1,035 + 2,509 = _____

12. 56 + 56 = _____


# Decimal Numbers and the Calculator

There is not much difference between computing with whole numbers and with decimal numbers. The major difference is the decimal point. Remember that decimal numbers are numbers that have a decimal point in them. Decimal numbers represent a mixed number or a number less than one. For example, 4.53 and 0.1205 are decimal numbers. A calculator expresses a fraction as a decimal number.

## Addition and Multiplication of Decimal Numbers

When you add or multiply decimal numbers with a calculator, the order of the numbers is not significant.

### Sample Problem

A delivery person made six trips in the company car this week. Use the entries in the log book to calculate the total mileage.

| | | BUSINESS MILES TRAVELED |
|---|---|---|
| MONTH 6 DAY 22 YEAR | | |
| ODOMETER READING | | |
| END OF TRIP | 26545.4 | |
| LESS BEGINNING OF TRIP | 26539.7 | |
| TOTAL BUSINESS MILES | | 5.7 |
| MONTH 6 DAY 22 YEAR | | |
| ODOMETER READING | | |
| END OF TRIP | 26773.1 | |
| LESS BEGINNING OF TRIP | 26760.8 | |
| TOTAL BUSINESS MILES | | 12.3 |
| MONTH 6 DAY 24 YEAR | | |
| ODOMETER READING | | |
| END OF TRIP | 26923.1 | |
| LESS BEGINNING OF TRIP | 26918.3 | |
| TOTAL BUSINESS MILES | | 4.8 |
| MONTH 6 DAY 27 YEAR | | |
| ODOMETER READING | | |
| END OF TRIP | 27187.5 | |
| LESS BEGINNING OF TRIP | 27177.4 | |
| TOTAL BUSINESS MILES | | 10.1 |
| MONTH 6 DAY 27 YEAR | | |
| ODOMETER READING | | |
| END OF TRIP | 27209.8 | |
| LESS BEGINNING OF TRIP | 27194.4 | |
| TOTAL BUSINESS MILES | | 15.4 |
| MONTH 6 DAY 28 YEAR | | |
| ODOMETER READING | | |
| END OF TRIP | 27262.5 | |
| LESS BEGINNING OF TRIP | 27255.0 | |
| TOTAL BUSINESS MILES | | 7.5 |
| MONTH DAY YEAR | | |
| ODOMETER READING | | |
| END OF TRIP | | |
| LESS BEGINNING OF TRIP | | |
| TOTAL BUSINESS MILES | | |
| TOTAL FOR WEEK | | |

*Mileage Log*




### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in each mileage entry, pressing the addition sign (+) between each entry: 5.7 + 12.3 + 4.8 + 10.1 + 15.4 + 7.5.

**Step 3:** Press the equal sign (=) to finish the problem.
5.7 + 12.3 + 4.8 + 10.1 + 15.4 + 7.5 = 55.8

### *Solution*

The total mileage is 55.8 miles.

Now work a decimal multiplication problem. Remember, the order you enter the numbers is not important in multiplication.

## Sample Problem

Bob is in charge of determining total production cost for an order his company has sold. He knows that each bolt in the assembly costs $.33. Each completed unit has 57 bolts. Calculate how much he should allow for the cost of the bolts for 200 units.

### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in .33 and then press the multiplication sign (×).

**Step 3:** Key in 57. Then, press the multiplication sign (×).

**Step 4:** Then key in 200 and the equal sign (=).
.33 × 57 × 200 = 3,762

### *Solution*

The total cost for the bolts for 200 units is $3,762.

## Subtraction and Division of Decimal Numbers

When you subtract or divide decimal numbers with a calculator, the order in which you enter the numbers is very important.

### Sample Problem

Jake wants to check the exact distance he drives from his home to his workplace every day. His odometer reads 42,987.2 before he leaves his driveway and 43,022.7 when he gets to work. Calculate the distance he drives to work.

#### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in the figure that Jake's odometer records when he gets to work, 43,022.7.

Press the minus sign (–).

**Step 3:** Then enter the odometer reading Jake recorded before he began his drive to work, 42,987.2

**Step 4:** Press the equal sign (=). 43,022.7 – 42,987.2 = 35.5

#### *Solution*

Jake drives 35.5 miles to work.

The calculator makes dividing large decimal numbers very easy.




## Sample Problem

Carl has to order industrial carpeting. He needs enough to cover at least part of the floor in each of seven offices. He found a sale on 1,555.75 square feet of a discontinued style. Calculate how many square feet of carpeting will he can put into each office with the sale carpeting if he plans to put the same amount in each office.

### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in the total amount of carpet, 1,555.75 square feet. Press the division sign (÷).

**Step 3:** Then enter the number of offices he has to buy for, 7.

**Step 4:** Press the equal sign (=): 1,555.75 ÷ 7 = 222.25

### *Solution*

He will be able to put 222.25 square feet of carpet in each office.

## Progress Check #3

Use your calculator to solve the following problems.

1. $39.23 \times .065$ = _____

2. $22.2 \div 5$ = _____

3. $58 + 58 + 398 + .076$ = _____

4. $5{,}000 - 529.78$ = _____

5. $65.7 \times 90 \times 8$ = _____

6. $2 - .087$ = _____

7. $6{,}478 - 24.578$ = _____

8. $748.50 \times .05$ = _____

9. $35 + .35 + 3.5$ = _____

10. $8 + .8 + 19.8 + 345$ = _____

11. $6{,}000 \div .87$ = _____

12. $41 \div 1.8$ = _____


# Fractions and the Calculator

You have learned to use a calculator to perform addition, subtraction, multiplication and division with whole numbers and decimal numbers. Next, you will perform the same operations with fractions. As you recall, fractions are numbers like 1/3, 3/8 and 17/9. They are written with a numerator (top number) divided by a denominator (bottom number). Recall that the horizontal line in a fraction, sometimes shown as a slash (/), means division.

A calculator represents fractions as a decimal number. A proper fraction entered into the calculator will have numbers to the right of the decimal point. An improper fraction entered into the calculator will have numbers to the left and right of the decimal point.

Since a fraction represents a division problem, enter it into your calculator as a division problem. To find the decimal equivalent of a fraction with your calculator, press the key for the top number. Then press the divide key (÷), then the key for the bottom number. Finally, press the equal key (=).

## Sample Problem

Find the decimal equivalent of 1/3 using a calculator.

### *Procedure*

**Step 1:** Press ON and clear the calculator.

**Step 2:** Enter the numerator (top number) of the fraction, 1. Then the divide key (÷).

**Step 3:** Enter the denominator (bottom number) of the fraction, 3.

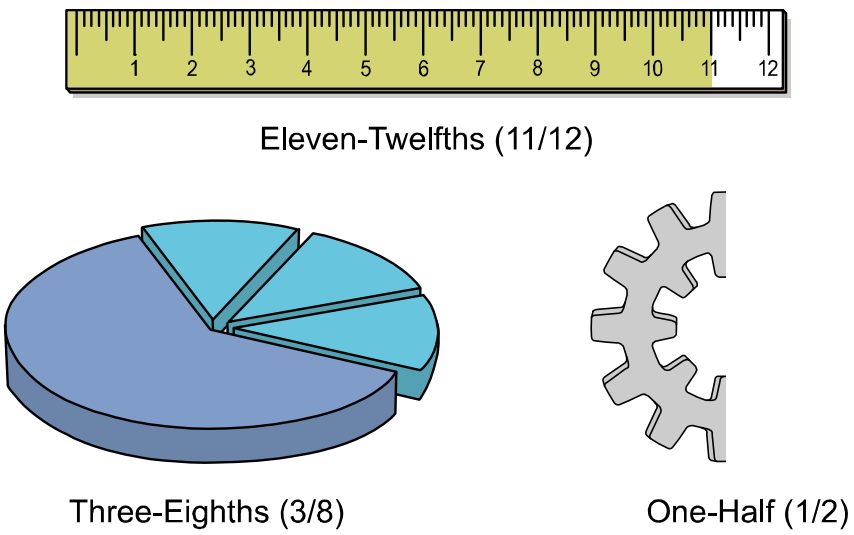
**Step 4:** Finally, press the equal key (=).

### *Solution*

The decimal equivalent of the fraction 1/3 is 0.33333.

## Fractions Equal to Less than One

Recall that proper fractions all have a numerator that is smaller in value than the denominator. Proper fractions have values less than one. For example, $11/12$, $4/7$, $2/3$ and $1/2$ are proper fractions.

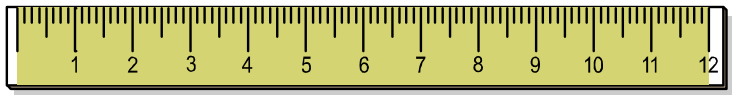



***Fractions Less than One***

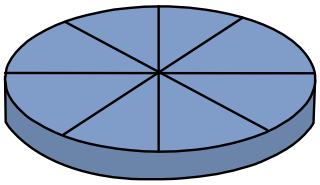
When you enter a proper fraction into a calculator, the number in the window has a decimal point on its left.

## Fractions Equal to One

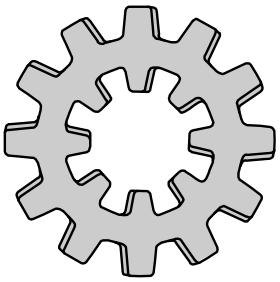
A fraction that has the same number for both the numerator and denominator equals one. Any number divided by itself will equal one.




Twelve-Twelfths (12/12)



Eight-Eighths (8/8)

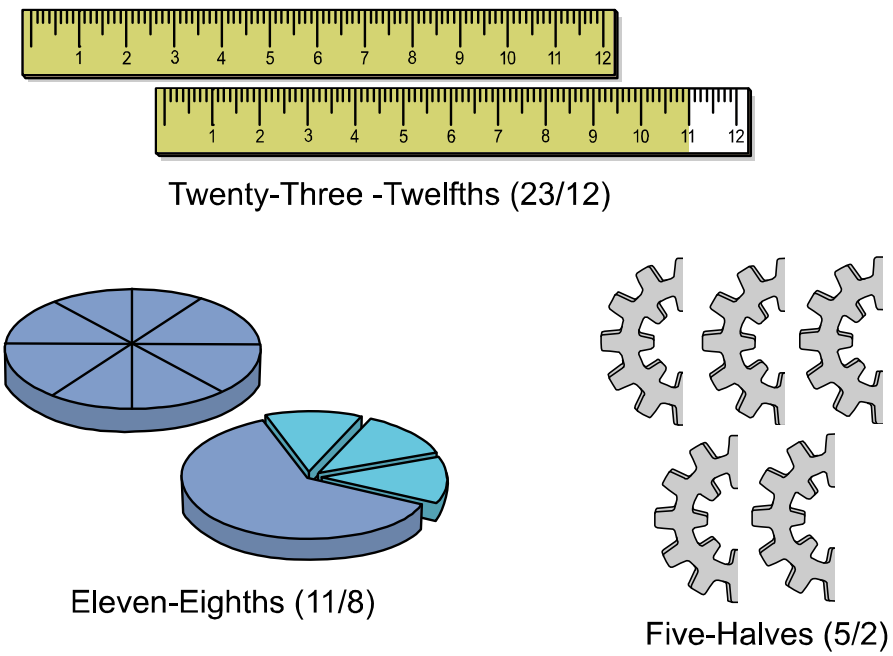


Two-Halves (2/2)

***Fractions Equal to One***

## Fractions Greater than One

An improper fraction has a numerator that is equal to or greater in value than its denominator. For instance, $^{13}/_{12}$ is an improper fraction. The top number, 13, is larger in value than the bottom number, 12. An improper fraction always has a value equal to or more than one.




***Fractions Greater than One***

If you know how to enter fractions into the calculator, you can add, subtract, multiply and divide fractions quickly. However, you may need to write decimal equivalents when you work with fractions on the calculator.




## Adding Fractions

When you add fractions with a calculator, you must first change the fraction to a decimal number. Remember that the basic calculator can only perform one operation at a time. First change all the fractions to decimals. Record each answer. Then use the calculator to add the answers.

### Sample Problem

A 6,000 pound casting of manganese bronze alloy is being made. The composition for manganese bronze is $^{11}/_{20}$ copper, $^{2}/_{5}$ zinc, $^{3}/_{100}$ manganese, $^{1}/_{125}$ tin, $^{1}/_{250}$ lead and $^{1}/_{125}$ other impurities. Find out whether the fractions account for the entire chemical makeup of the casting.

#### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in 11 ÷ 20 and write down the answer, .55.
Clear for the next entry.

**Step 3:** Key in 2 ÷ 5 and write down the answer, .4. Clear.

**Step 4:** Key in 3 ÷ 100 and write down the answer, .03. Clear.

**Step 5:** Key in 1 ÷ 125 and write down the answer, .008. Clear.

**Step 6:** Key in 1 ÷ 250 and write down the answer, .004. Clear.

**Step 7:** Key in 1 ÷ 125 and write down the answer, .008. Clear.

**Step 8:** Now that you have converted all the fractions to decimal numbers, add the decimal fractions. .55 + .4 + .03 + .008 + .004 +.008 = 1

#### *Solution*

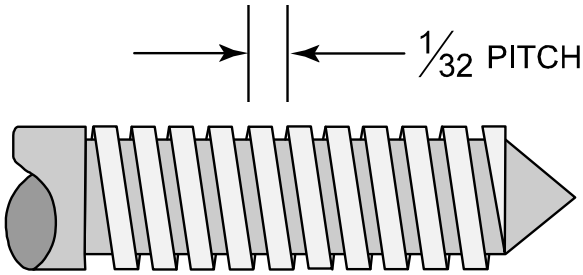
The fractions account for the entire chemical makeup of the casting.

## Multiplying Fractions

In multiplication, as with addition, the order in which you key in numbers does not matter. However, to multiply fractions, you must first convert the fractions to decimal numbers, then multiply.

### Sample Problem

With a complete turn, a screw advances a distance equal to the "pitch." The pitch of a #8 screw is 1/32 inch. Determine how far the screw will advance if it is tightened 1/2 turn. Express your answer in decimal inches. Round your answer three decimal places.




*A #8 Screw*

### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Find the decimal equivalent for the fraction $1/32$. (Remember, to find a fraction's decimal equivalent, divide the numerator by the denominator.) Write the answer, .03125, on a piece of paper. Clear the window.

**Step 3:** Find the decimal equivalent for the fraction $1/2$. Write down the answer, .5. Clear the window.

**Step 4:** Now that you have converted the fractions to decimals, you can multiply. $.03125 \times .5 = 0.015625$

**Step 5:** Round off to three decimal places. 0.016

### *Solution*

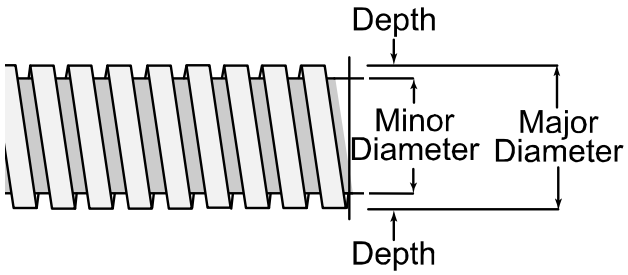
The screw will advance approximately 0.016 inch if it is tightened one-half turn.

## Subtracting Fractions

When you use a calculator to solve subtraction or division problems, the order in which you enter numbers is important. This is true whether you are working with whole numbers, decimals, or fractions. Since operations with fractions often require several steps, be sure to keep a pencil and paper handy. The procedure for subtraction of fractions is basically the same as it is for addition or multiplication. Be careful to key in the numbers in the correct order.

### Sample Problem

The major (or outside) diameter of a certain screw is $5/8$ inch. The minor (or inside) diameter is $7/16$ inch.




*Depth of Screw Threads*

Find the depth of the screw thread.




### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in 5 ÷ 8 = and write down the answer, 0.625. Clear the window.

**Step 3:** Key in 7 ÷ 16 = and write down that answer, 0.4375. Clear the window.

**Step 4:** Now you can key in the subtraction problem: 0.625 – 0.4375 = 0.1875. Do not clear the window.

**Step 5:** Depth appears on each side, so 0.1875 must be divided by 2. Press the division sign (÷) and the number 2, then press the equal key (=). 0.1875 ÷ 2 = 0.09375

### *Solution*

The depth of the screw thread is 0.09375 inch.

## Division of Fractions

Remember that in division the order in which you enter the numbers is important.

### Sample Problem

Divide $2/5$ by $1/2$.

#### *Procedure*

**Step 1:** Turn the calculator ON and clear the window.

**Step 2:** Key in 2 ÷ 5 = to find the decimal equivalent of the fraction $2/5$.

Write the answer, 0.4, on a sheet of paper.

**Step 3:** Clear the window. Now key in 1 ÷ 2 = to find the decimal equivalent of the fraction $1/2$.

Write the answer, 0.5, on a sheet of paper.

**Step 4:** Clear the window. Now you are ready to key in the division problem. 0.4 ÷ 0.5 = 0.8.

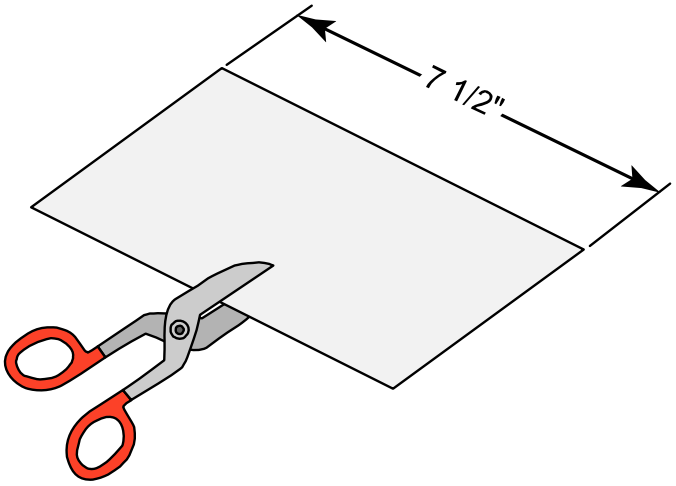
#### *Solution*

The answer when $2/5$ is divided by $1/2$ is 0.8.

Now solve a division problem with fractions when mixed numbers are involved. A mixed number is a combination of a whole number and a fraction, such as $9\ 7/8$ or $2\ 3/4$. When you read a mixed number, you say "nine and seven-eighths" or "two and three-fourths." You identify both the whole number and the fraction.

## Sample Problem

Determine how many 3/4 inch strips of stock can be cut from a strip that is 7 1/2 inches long.




*Cutting Shim Stock Strips*

### *Procedure*

**Step 1:** Turn the calculator ON. Clear the window.

**Step 2:** Find the decimal equivalent of 7 1/2. You know that 7 is a whole number and will remain a whole number, but you have to find the decimal equivalent of 1/2. Key in the division problem 1 ÷ 2 to get the decimal .5. Now you can write 7 1/2 as a decimal number, 7.5.

**Step 3:** Clear the window. Now find the decimal equivalent of 3/4. Key in the problem 3 ÷ 4 =. The answer is 0.75.

**Step 4:** Clear the window. Now you are ready to perform the division problem. 7.5 ÷ 0.75 = 10

### *Solution*

Ten 3/4 inch strips of stock can be cut from the 7 1/2 inch strip.

## Progress Check #4

1. Key in the following fractions, then write the decimal equivalent.

   a. $3/7 =$ _____

   b. $3/25 =$ _____

   c. $6/7 =$ _____

Solve the following problems:

2. $9/10 + 3\ 5/9 =$ _____

3. $7/8 + 3/4 + 2\ 5/7 =$ _____

4. $3\ 3/4 - 2\ 2/3 =$ _____

5. $5/8 \div 2 =$ _____

6. $1/7 \div 7/10 =$ _____

7. $17\ 1/10 - 5\ 2/25 =$ _____

8. $9/25 - 3/20 =$ _____

9. $4/5 \times 5/2 =$ _____

10. $2\ 1/5 \times 6\ 3/5 =$ _____

11. $5/8 \times 2/5 \times 1/3 =$ _____

12. $7\ 1/4 \div 1\ 1/8 =$ _____


# The Memory Function

Your calculator probably has a memory, a storage place for a number you want to use later. It is useful for working problems that involve more than one operation. Putting a number in memory is similar to recording it on a piece of paper. Later, when you need it, you can bring the number out of memory. This is similar to looking at the number you recorded on the piece of paper.

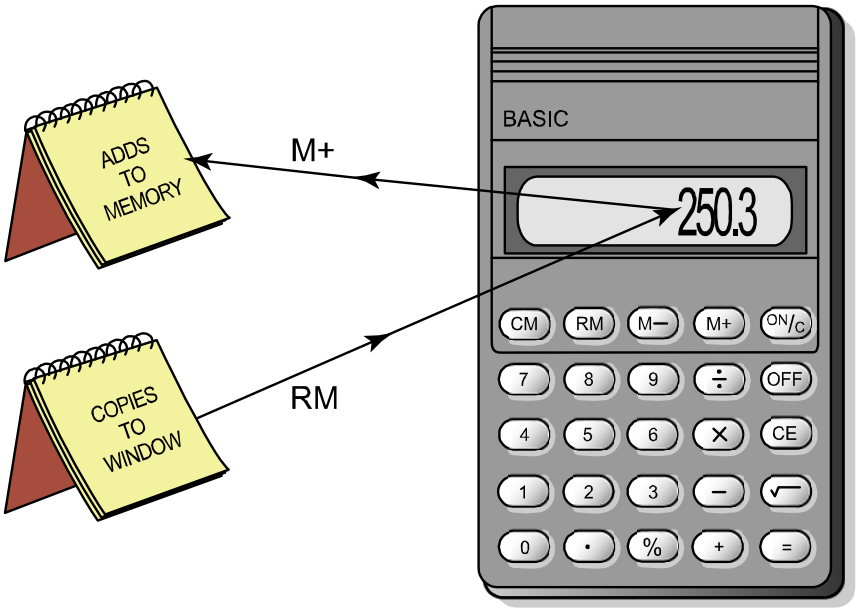
Not all calculators mark the memory key in the same way. You may need to consult the directions that came with your calculator.

Usually there is a key that you press to add a number to the memory. Find the key on your calculator that adds a number into the memory. Pressing it adds the number in the display window to the number in the memory. The number in the display window does not change.

For example, consider what happens when you key in the number 10 and then press the M+ key. You will still see 10 in the window, but now it is in the memory, too. Some calculators indicate a number is in the memory by showing an "M" somewhere in the display window. When the memory is empty, or has a zero (0) in it, the M does not show in the display.

Many calculators have a key labeled RM or MR for Recall Memory. The RM key makes a copy of the number in memory and displays it in the window. This erases the previous number in the display window, but the number in memory stays the same.

You should still have the number 10 in the calculator window and in the memory. Now, key in the problem 6 + 9 = 15. Did you notice that the number 10 in the window disappeared and the answer you got was 15? But, if you press the RM key, the 10 that is in the memory is brought into the window. The 10 will stay in memory for you to use as long as you do not erase it from the memory bank.




*Using the Memory Function of a Calculator*

Calculators that allow you to save a memory also have a key for clearing the memory. Often this key is marked CM. Always clear the memory before you start any problem.




## Addition and Subtraction Problems and the Memory Key

You might be able to work the following Sample Problems faster with pencil and paper than with your calculator. However, use the calculator so that you can learn how the memory of the calculator works.

### Sample Problem

A company has batteries stored in five different warehouse locations. At the beginning of the month, the different warehouses report inventories of 123, 80, 45, 231 and 189 batteries. During the month, two outgoing shipments are made, one of 100 and one of 200 batteries. Also, during the month there are incoming shipments of 120, 48 and 72 batteries.

Find out what the total inventory is at the beginning of the month.

#### *Procedure*

**Step 1:** Clear the calculator and the memory.

**Step 2:** With your calculator, add the five beginning inventories to find the total for the beginning of the month.
123 + 80 + 45 + 231 + 189 = 668.

#### *Solution*

The inventory at the beginning of the month was 668 batteries.

Use the information calculated in the previous sample problem to provide more information.

## Sample Problem

Find the inventory at the end of the month.

### *Procedure*

**Step 1:** While the total is still in the display window, press the memory key to put this total in the memory. The memory now has the beginning total in it. Notice the M in the display window.

**Step 2:** Now you can key in a new number and the calculator will start a new problem.

**Step 3:** Clear the window. (The little M will remain.) Add together the outgoing shipments by pressing the keys for 100 + 200.
100 + 200 = 300

**Step 4:** Next, subtract this total from the inventory at the beginning of the month that is in the memory. With some calculators, you can do this by pressing a key labeled M–. This subtracts the number in the display window (300) from the number in memory (668). With other calculators, you press the ± key to change the number in the window to –300 and then press the M+ key to combine the –300 and the total that is stored in memory, 668. This is the same as subtracting the 300 outgoing shipments from the beginning total of 668. The calculator works 668 – 300 as 668 + (–300). Now the memory holds the beginning total minus the transfers.

**Step 5:** Clear the window. To add the incoming shipments, press the keys 120 + 48 + 72. 120 + 48 + 72 = 240

The total of the incoming shipments is now in the display window.

**Step 6:** To add this incoming amount to the total in memory, press the M+ key. Now the memory holds the total inventory for the end of the month.

**Step 7:** To see the contents of the memory, press the RM (Recall Memory) key. The number you see in the display window is the inventory at the end of the month.

### *Solution*

At the end of the month, the inventory was 608 batteries.

## Multiplication Problems and the Memory Key

The memory feature of your calculator can help you work multiplication problems, too.

### Sample Problem

You have $50 to spend. You buy 6 items at $1.29 each, 17 items at $0.79 each and 9 items at $2.56 each. Find the amount of money you have left.

#### *Procedure*

**Step 1:** Clear the display window and the memory.

**Step 2:** Key in 6 × $1.29 = to get the total for the first item.

**Step 3:** Press the memory key to put this partial answer into the calculator memory. Clear the display window.

**Step 4:** Now, find the total for the second item. Key in 17 × $0.79 =. Press the add-to-memory key (M+) to add this partial answer to the partial answer that is already in the memory.

**Step 5:** Clear the display window.

**Step 6:** Find the total for the third item and add it to the memory (M+).

**Step 7:** Clear the display window. Now the memory holds the total for all of the purchased items.

**Step 8:** To find the difference between this total and $50, key in 50, then the M– key and then the RM key. The display window will show how much money you have left. 50 – 44.21 = 5.79 (Do not clear the memory. You will need that figure in the next sample problem.)

#### *Solution*

You have $5.79 of the $50.00 left.




## Sample Problem

When you get to the checkout counter, sales tax is added to your purchase. The sales tax is 7 1/4 percent. Determine whether or not you will have enough money to pay for your purchases and the tax.

### *Procedure*

**Step 1:** Press the recall memory key (RM). The window shows 44.21, the total of your purchases.

**Step 2:** To figure the sales tax, you need to find 7 1/4 percent of $44.21. Because "of" signals times or multiplication, the problem now is to multiply $44.21 (already in the display window) by 7 1/4 percent.

**Step 3:** Enter 7 1/4 into the calculator by converting this fraction to a decimal. Remember that 1/4 is 1 divided by 4 on your calculator. The answer will be 0.25. Therefore, 1/4 percent is 0.25 percent or 0.0025.

You know that 7 percent means 7 per 100 or 7/100 and you can write that as 0.07. So, 7 percent is 0.07 and 1/4 percent is 0.0025. That means that 7 1/4% is equal to 0.0725. Now you are ready to multiply.

**Step 4:** With 44.21 in the display window, press the multiplication key (×) and then key in 0.0725 then the equal sign (=) to find the amount of the tax. Notice that your calculator displays this to more than two decimal places. 44.21 × 0.0725 = 3.205225

Leave the amount in the long form until you get to the end of the problem.

**Step 5:** You have to pay the tax plus the cost of your to add the number in the display window to the memory.

The memory now holds the total you will have to pay, including tax.

**Step 6:** Press the RM key to see this final total.
44.21 + 3.205225 = 47.415225

**Step 7:** To find out exactly how much change you should get, key in 50 and press the minus key (–). Then press the RM key to recall the amount in memory. Then press the equal key (=), 50 – 47.415225 = 2.584775

**Step 8:** Round the answer off to two decimal places.

### *Solution*

Your change is $2.58. You have more than enough for your purchases plus tax.




## Progress Check #5

Use the memory key, where applicable, to solve the following problems:

1. Suppose you start out with a savings account balance of $358.68. Then you make deposits of $87.15, $126.43 and $125.00. The final deposit slip indicates a balance of $711.21.

   a. The total of your deposits is _____.

   b. The sum of the initial balance and the three deposits is _____.

   c. The difference between Part b and the balance on the final deposit slip is interest the bank credited to your account. The amount of interest credited to your account is _____.

2. Eight individually powered machines are used in a small production shop:

   Machine A uses 420 watts. Machine E uses 310 watts.

   Machine B uses 255 watts. Machine F uses 515 watts.

   Machine C uses 550 watts. Machine G uses 730 watts.

   Machine D uses 480 watts. Machine H uses 470 watts.

   a. The total wattage used when all the machines are running at the same time is _____.

   b. The total wattage used must be limited to 3,000 watts. Machines C, F and G must be kept running. The fewest number of the other machines that can be turned off to keep the total power usage below 3,000 watts is _____. Name the machines you would turn off.

      _____

3. On a vacation trip, you plan to travel at an average speed of 60 miles per hour. The total distance you will travel is 1,170 miles.

   a. It will take _____ hours of driving to travel the total distance.

   b. You expect one overnight stay of 10 hours, 2 meal stops of 3/4 hour each and 3 fuel stops of 1/4 hour each. The total time needed for your vacation travel is _____ hours.

4. Pat begins the month with $178 in a checking account. During the month, she deposits (puts into her account) checks for $13.76, $5.86 and $10.18. She writes checks for $23.67, $14.53, $9.08 and $4.20. Her deposits total $_____. Her checks total $ _____. She has $_____ in her account at the end of the month.


# The Percent (%) Key

One way to find percent is first changing the percent to a decimal and then multiplying. Many calculators have a percent (%) key. The percent (%) key on your calculator allows you to calculate percentage without performing multiplication. The calculator will do it for you.

## Sample Problem

Your plant manager has told you to plan on a 13 percent layoff at the beginning of the year. You have 800 workers on the floor. Current weekly production of particle board is 556 units. You estimate that production will probably drop by 28 percent. First, determine how many people will be laid off. Also calculate how many particle board units will be produced on a weekly basis with the reduced work force.

### *Procedure*

**Step 1:** First, find out how many people will be laid off.

**Step 2:** Turn the calculator ON and clear the window and the memory.

**Step 3:** Key in the total number of employees working, 800. Key in the multiplication sign (×).

**Step 4:** Next, key in the amount of the percent and the percent sign, 13%. 800 × 13% = 104. 13% of 800 is 104.

### *Solution*

One hundred four (104) people will be laid off.

The second part of the question is a little trickier. Note that it does not ask how many particle board units will be dropped from production. Instead, it asks how many will be produced. First, you will have to figure the number of units that will be lost when production is reduced. Then, subtract that number from the current total.

### *Procedure*

**Step 1:** Clear the calculator window.

**Step 2:** Key in the total number of particle board units produced in a week, 556. Key in the multiplication sign (×).

**Step 3:** Then, key in the amount of the reduction percentage, 28. Press the percent key (%). 556 × 28% = 155.68

You will be producing 155.68 fewer units after the layoff.

**Step 4:** However, you need to know how many particle board units will be produced. To find the new number of units, you must subtract the number you just calculated from the current production total.

You already have the number 155.68 in the window of your calculator. Save that entry by pressing the M+ key. Now 155.68 is in the calculator's memory.

**Step 5:** Now, press the clear key to clear the window. (Remember, though, you have saved the number 155.68.)

**Step 6:** Key in the total number of units currently in production, 556. To subtract the expected drop in production, press the minus sign (–).

**Step 7:** Press the RM key to recall that 155.68 from memory. Press the equal sign (=).

When you pressed the RM key, the calculator recalled the number it had stored in memory, 155.68. When you pressed the equal sign (=), it subtracted that number from 556, thus 556 – 155.68 = 400.32

### *Solution*

You be will producing 400.32 units per week after the layoff.




## Progress Check #6

1. Rena wants to buy a typewriter that costs $750. If the sales tax is 4%, Rena will have to pay _____ for sales tax. The total amount she will pay for the typewriter is _____.

2. Jim is planning a reception for the company's new boss. He estimates that 75% of the employees will come to the reception. There are 520 employees. He should plan for _____ employees to attend.

3. David collects debts for the Lawrence Collection Agency. He gets 20% of all debts collected. If he collects $1,750, he will receive _____.

4. Sarah is to pay 60% of a $975.00 bill she received from Harris products. She will pay _____.

5. Jim's Men's Wear is having a going-out-of-business sale. All merchandise is 65% off. The sale price of a coat originally marked $165.00 is _____.

6. The original price of a certain microcomputer system is $1,700. John's Computer Store is advertising it at 25% off. The price of the system at John's Computer Store is _____.

7. Fred's business borrowed $7,500.00 for one year at 13 1/2% simple interest. _____ is due the bank in one year.

8. Mark traded in his old car to a dealer for a new model. The dealer gave him a trade-in value equal to 20% of the new car price. The new car's list price was $14,885. Find the amount of Mark's trade-in. _____

9. 550 × 80% = _____

10. 600 × 48% = _____

11. $350 \times 22\% =$ _____

12. $2{,}500 \times 95\% =$ _____

13. $400 \times 125\% =$ _____

14. $2{,}450 \times 40\% =$ _____

15. $36 \times 100\% =$ _____


# Squaring a Number and Using the Square Root Key

Sometimes, you have to multiply a number by itself. For example, you may have to multiply 25 by 25. This operation is called squaring a number. Using a calculator simplifies the process.

To square a number with a calculator, first key in the number to be squared and a multiplication sign (×). Then, key in the same number again.

## Using the Square Root Key (√)

To find the square root of a number you must determine what number, when multiplied by itself, produces the original quantity. For example, what number, when multiplied by itself, produces 100? The answer is 10. So, the square root of 100 is 10.

Finding the square root with a pencil and paper can be a very long process. But the square root key (√) makes it easy to find square roots.

### Sample Problem

Find the square root of 25.

***Procedure***

**Step 1:** Clear the window.

**Step 2:** Key in the number whose square root you want to find, in this case, 25.

**Step 3:** Press the equal key (=). The number 5 appears in the window. 5 times itself equals 25.

### *Solution*

The square root of 25 is 5.

For our purposes here, it is only important that you know how to find the square root of a number. When you progress to more advanced levels of training, you will learn when to use the square root key (√). Squaring and finding the square root of a number are useful when working on mechanical layouts or using electrical quantities.

## Progress Check #7

1. Square the numbers in the problems that follow:

   a. 15 = _____

   b. 20 = _____

   c. 100 = _____

   d. 42.5 = _____

   e. 0.05 = _____

   f. 5.5 = _____

   g. 13 = _____

   h. 1 = _____

   i. 11.11 = _____

2. Find the square root of the numbers in the problems that follow:

   a. 100 = _____

   b. 64 = _____

   c. 1.21 = _____

   d. 3,969 = _____

   e. 14,400 = _____

   f. 0.3364 = _____

   g. 4,225 = _____

   h. 1,697.44 = _____

   i. 182.25 = _____

## Notes:


# Summary

A basic calculator is a useful tool for addition, subtraction, multiplication, division, finding percentages and finding square roots. Data is viewed through the window of a calculator. Data is keyed into the calculator on the numeric key pad.

The CA key on a calculator clears everything. The C key clears everything except that which is stored in the memory. The CE key clears only the last entry.

Whole numbers are the digits from zero to nine and any combination of those digits.

Fractions express a divided quantity. A fraction has two parts, the number on the top, or numerator and the number on the bottom, or denominator. A proper fraction has a value equal to less than one; it has a numerator that is smaller than its denominator. An improper fraction has a value equal to or greater than one; it has a numerator that is equal to or greater than its denominator.

A mixed number is a combination of a whole number and a fraction.

Decimal numbers are numbers that have a decimal point in them. Decimal numbers may represent fractions or mixed numbers.

When numbers are added or multiplied, the order in which they are entered into the calculator does not matter. When numbers are subtracted or divided, the order in which they are entered into the calculator does matter.

The memory on a calculator stores numbers for later use. The M+ key adds the number showing in the window to the memory of the calculator. The RM (Recall Memory) key makes a copy of the number in memory and displays it in the window. The CA (Clear All) key clears the memory and the display in the calculator window. The CM (Clear Memory) key clears only the numbers stored in memory.

The percent key (%) calculates percentage.

Squaring a number means multiplying a number by itself. Finding the square root of a number means finding what number multiplied by itself gives the number whose square root you are seeking. The square root key (√) calculates square root.


# Glossary

**Calculator** — A machine used for performing mathematical operations.

**Clear Key** — Erases data from the window and/or the memory of the calculator.

**Decimal Number** — Fraction of a number or a mixed number, written with a decimal point that designates tenths, hundredths, thousandths. An example of a decimal number is 3.24.

**Fraction** — A portion of a whole amount. Expressed as a division problem, with a numerator and a denominator. For example, 5/6 is a fraction.

**Improper Fraction** — A fraction with the numerator larger than, or equal to, the denominator. For example, 5/4 is an improper fraction.

**Memory Function** — A storage function in the calculator where numbers are stored, then recalled to use again.

**Mixed Number** — A combination of a whole number and a fraction. For example, 6 3/4 is a mixed number.

**Numeric Key Pad** — On a calculator, the group of keys with numerals on them.

**Proper Fraction** — A fraction with the numerator smaller than the denominator. For example, 5/6 is a proper fraction.

| | |
|---|---|
| **Square Root** | The square root of a number is the number that, when multiplied by itself, gives the number whose square root you are seeking. For example, the square root of 4 is 2. |
| **Squaring a Number** | Multiplying a number by itself. To square the number 5, multiply $5 \times 5$. |
| **Whole Number** | Numbers without fractional parts, like 7, 16, 143 and 1,972. A digit from 0 to 9 or a combination of those digits, like 1,091. |
| **Window** | The portion of the calculator that allows you to view data. |