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Workforce Development:

Module 1

1.1 Lessons Abbreviation Key Table

C = Calculator Lesson
P = Pre-algebra Lesson
A = Algebra Lesson
G = Geometry Lesson
T = Trigonometry Lesson
S = Special Topics

The number following the letter is the Lesson Number.

E = Exercises with Answers: Answers are in brackets [ ].
EA = Exercises Answers: (only used when answers are not on the same page as the exercises.)
ES = Exercises Supplemental: Complete if you feel you need additional problems to work.

1.2 Exercises Introduction

Why do the Exercises?

Mathematics is like a "game." The more you practice and play the game the better you will understand and play it.

The Foundation's Exercises, which accompany each lesson, are designed to reinforce the ideas presented to you in that lesson's video.

It is unlikely you will learn math very well by simply reading about it or listening to Dr. Del, or anyone else, or watching someone else doing it.

You WILL learn math by "doing math."

It is like learning to play a musical instrument, or write a book, or play a sport, or play chess, or cooking.

You will learn by practice.

Repetition is the key to mastery.

You will make mistakes. You will sometimes struggle to master a concept or technique. You may feel frustration sometimes "**WE ALL DO.**"

But, as you learn and do math, you will begin to find pleasure and enjoyment in it as you would in any worthwhile endeavor. Treat it like a sport or game.

These exercises are the KEY to your SUCCESS!

ENJOY!

TI-30XA INTRODUCTION

The TI-30XA Scientific Calculator is very good for Practical Mathematics. We have chosen this model for its ease of use and low cost. You may use another calculator, but be aware that they all have different key positions and work somewhat differently.

This series of lessons will explain the various basic functions and processes we will be using in the Fundamentals Course.

Each lesson will consist of a video explanation of the lesson's topic and homework to reinforce the lesson.

After you have mastered the topic you may take a quiz to prove your mastery of the topic. It is best to master each topic sequentially since later topics may depend on previous topics.

IMPORTANT: Mathematics is like a "contact sport." You must play and practice to master the necessary skills and knowledge.

Most people find mathematics like a game whereby knowledge and skills are acquired over time with practice and study.

Treat it like a game. Have fun! Do not be discouraged by mistakes or setbacks. That is part of the game.

Your learning will be cumulative. You will notice that things that seem difficult today will become easy tomorrow.

C1 LESSON: ON/OFF FIX DEG M1 M2 M3

TI-30XA is the "Power Tool" we will be using.

Keys will be underlined. There are 40 Keys.

36 of these Keys have a dual function indicated in yellow above the key, and reached by the Yellow 2nd Key

    <u>On/C</u> is the On and Clear Key: Upper Right

    <u>OFF</u> is the Off Key: Row 1 Column 5

In the Display at top of calculator:

M1 M2 M3 are the memory indicators (top left - Lesson C5)

DEG is angle indicator (Lesson C12)

FIX indicates you have fixed the number of digits that appear after the decimal point. It is located above the decimal point at bottom.

Nine digits is the default when you turn on the calculator.

A good practice is to turn the calculator <u>OFF</u> between calculations. Numbers stored in Memory, M1, M2, M3 will not be lost.

Take the C1 Quiz when you are ready.

ON/OFF   FIX   DEG   M1 M2 M3

1. TI-30XA is a P _ _ _ _ T _ _ _ of math?

2. The TI-30XA has how many keys?

3. How many of these keys are dual function?

4. You activate a dual function with which key?

5. The ON/C key does what?

6. Where is the ON/C key?

7. Where is the OFF key?

8. How many Memory registers are there in the TI-30XA?

9. Where is their indicator in the Display?

10. What does the DEG indicate in the display?

11. Where is the FIX function, and what does it do?

12. How do you display "n" digits after the decimal point?

ON/OFF FIX DEG M1 M2   Answers: [ ]'s

1. TI-30XA is a P _ _ _ _ T _ _ _ of math?   [**Power Tool**]

2. The TI-30XA has how many keys?   [**40**]

3. How many of these keys are dual function?   [**36**]

4. You activate a dual function with which key?
   [**Yellow "2ND" Key in upper left corner.**]

5. The ON/C key does what?
   [**Turns TI 30XA on and Clears the registers, and sets DEG. It does not change memory.**]

6. Where is the ON/C key?   [**Upper Right Corner**]

7. Where is the OFF key?   [**Below the ON/C Key**]

8. How many Memory registers are there in the TI-30XA?
   [**Three, M1, M2, M3**]

9. Where is their indicator in the Display?   [**Upper Left**]

10. What does the DEG indicate in the display?
    [**Angles will be entered in degrees**]

11. Where is the FIX function, and what does it do?
    [**Above the decimal point at bottom. It fixes the number of digits displayed after the decimal point.**]

12. How do you display n digits after the decimal point? [**2nd FIX n**]

C2 LESSON: REAL NUMBERS: ADD + SUBTRACT - EQUAL =

We assume you know basic arithmetic operations and rules. If not, you will need some more basic training.

Key k is indicated by <u>k</u> the underline.

The <u>=</u> Key is used to complete a calculation.

Addition <u>+</u> Key adds two numbers 3 <u>+</u> 4 <u>=</u> 7

Subtraction <u>-</u> Key subtracts numbers 7 <u>-</u> 2 <u>=</u> 5

Negative numbers will be discussed in Lesson 3

The TI-30XA will take care of decimal locations.

$$12.3 \underline{+} 7.5 \underline{=} 19.8 \qquad 12.3 \underline{+} 7.05 \underline{=} 19.35$$

Practice makes perfect!

The calculator is also a very good tool to help you learn the addition or multiplication tables.

And also, to help you learn to do approximate calculations which are a good idea to do a "quick check" for mistakes.

The more you "play" with it…the better you'll get!

ADD + SUBTRACT - EQUAL = Answers: [ ]'s

1. What key completes a calculation?   [=]

2. Which key adds two numbers?   [+]

3. Which key subtracts two numbers?   [-]

4. 12.3 + 4.8 = ?   [**17.1**]

5. 375 + 897 = ?   [**1272**]

6. 0.075 + 0.0345 = ?   [**0.1095**]

7. 87 - 39 = ?   [**48**]

8. 12.34 - 7.05 = ?   [**5.29**]

9. 0.0087 - 0.00032 = ?   [**0.00838**]

10. 12 + 56 + 32 + 89 = ?   [**189**]

11. 37 - 48 = ?   [**-11**] (See C3 for Negative Numbers)

12. 3,879 + 7,425 = ?   [**11,304**] (You supply commas)

13. 2.32 + 0.073 = ?   [**2.39**]

**Take the C2 Quiz if you are ready,
or do some more exercises, C2ES.**

ADD + SUBTRACT - EQUAL = Answers: [ ]'s

1. 17.3 + 234.8 + 3.7 = ?   [255.8]

2. 37.5 + 8.97 = ?   [46.47 or 46.5]

3. 0.175 + 0.0385 = ?   [0.214]

4. 97 - 19 = ?   [78]

5. 12.74 - 9.05 = ?   [3.69]

6. 0.087 - 0.032 = ?   [0.055]

7. 12 + 96 + 52 + 29 = ?   [189]

8. 57 - 98 = ?   [-41]

9. 3,979 + 4,425 = ?   [8404]

10. 28 - 12 - 17 = ?   [-1]

11. 2.72 + 0.773 = ?   [3.493]

12. 54321 - 12345 = ?   [41976]

13. 9999 - 7654 = ?   [2345]

Take the C2 Quiz or review.

For every positive number N there is a corresponding N negative number -N, and vice versa.

> N + (-N) = 0   7 + (-7) = 0

> - (-N) = N   - (-6) = 6

You may create -N from N with the **+ ↔ -** Key located just left of the **=** Key

> N **+ ↔ -** yields -N   17 **+ ↔ -** yields -17

> -17 **+ ↔ -** yields 17

Subtraction is the same as adding a negative number.

> N - M = N + (-M)   8 - 3 = 8 + (-3) = 5

> -5 - 6 = -5 + (-6) = 5 **+ ↔ -** + 6 **+ ↔ -** = -11
>   -5   +   -6   = -11

Play with this until you are comfortable with it. It's really easy once you catch on to it. Homework will really help here.

When you have mastered it, take the C3 Quiz.

NEGATIVE NUMBERS   Answers: [ ]'s

1. Where is the key that creates the negative of any number in
    the calculator's display?   [**Bottom, Left of =**]

2. Create **-7** in your calculator   [**7 +=-**]

3. 8 + (-8) = ?   [**0**]

4. 9 + (-4) = ?   [**5**]

5. **-** (-5) = ?   [**5**]

6. -7 + (-8) = ?   [**-15**]

7. 18 - 11 = ?   [**7**]

8. 18 + (-11) = ?   [**7**]

9. 327 - 568 = ?   [**-241**]

10. -13.7 + 8.5 = ?   [**-5.2**]

11. -(-(- 7)) = ?   [**-7**]

12. -3 + (-4) + (-5) = ?   [**-12**]

**Take the C3 Quiz if you are ready,
or do some more exercises, C3ES.**

NEGATIVE NUMBERS   Answers: [ ]'s

1. -(-(-6)) = ?   [**-6**]

2. Create **-27** in your calculator   [**27+=-**]

3. 18 + (-18) = ?   [**0**]

4. 19 + (-8) = ?   [**11**]

5. - (-8) = ?   [**8**]

6. -9 + (-4) = ?   [**-13**]

7. 18 - 61 = ?   [**-43**]

8. 18 + (-61) = ?   [**-43**]

9. 3827 - 968 = ?   [**2859**]

10. -18.7 + 7.5 = ?   [**-11.2**]

11. -(-(- 2.7)) = ?   [**-2.7**]

12. -7 + (-4) + (-2) = ?   [**-13**]

Take the C3 Quiz or review.

C4 LESSON: MULTIPLY   x   DIVIDE ÷

We assume you know basic arithmetic operations and rules.
If not, you will need some more basic training.

Key **k** is indicated by **k** the underline.

The **=** Key is used to complete a calculation.

Multiplication **x** Key multiplies two numbers

   3 **x** 4 = 12   12.5 **x** 7.8 = 97.5

   (3/8) **x** (5/6) = 5/16 (See Lesson 10 x on fractions.)

Rules:

   (-A)**x**B = -(AxB) or (-A)B = -(AB)
   (-A)x(-B) = AxB or (-A)(-B) = AB

Division **÷** Key Divides two numbers

A/B means A **÷** B

   12/4 = 12 ÷ 4 = 3   15.7 ÷ 2.8 = 5.6

   A/(-B) = -(A/B) = (-A)/B   18 ÷ -6 = -3

   (-A)/(-B) = A/B   (-15)/(-5) = 3

Again, practice is the key to mastery.
Have fun with the exercises. Then take the C4 Quiz.

MULTIPLY x / DIVIDE ÷   Answers: [ ]'s

1. 3.5 x 7.4 = ?   [**25.9**]

2. 154 x 896 = ?   [**137,984**] (You put in the
                                                comma.)

3. 0.0075 x 0.02 = ?   [**0.00015**]

4. -54 x 87 = ?   [**-4698**]

5. (-32) x (-76) = ?   [**2432**]

6. 79 ÷ 3 =   [**26.3**]

7. 859 ÷ 54 = ?   [**15.9**]

8. 86 ÷ (-3) = ?   [**-28.7**]

9. (-45) ÷ (-2.5) = ?   [**18.0**]

10. (87 x 34) ÷ 5 = ?   [**591.6**]

11. (5.4 x 7.1)x2.3 = ?   [**88.2**]

12. 8754 ÷ (-23) = ?   [**-381**]

13. (54.2 ÷ 3.4) x (8.7 ÷ (-4.3)) = ?   [**-32.3**]

Take the C4 Quiz or do some more exercises, C4ES.

MULTIPLY x   DIVIDE ÷   Answers: [ ]'s

1. 3.8 x 9.4 = ?   **[35.7]**

2. 74 x 396 = ?   **[29304]**

3. 0.0035 x 0.08 = ?   **[0.00028]**

4. -59 x 27 = ?   **[-1593]**

5. (-36) x (-82) = ?   **[2952]**

6. 89 ÷ 4 = ?   **[22.25]**

7. 869 ÷ 34 = ?   **[25.6]**

8. 88 ÷ (-3) + ?   **[-29.3]**

9. (-47) ÷ (-6.5) = ?   **[7.2]**

10. [47 x 74] ÷ 6 = ?   **[580 or 579.67]**

11. (5.6 x 7.3) x 2.9 = ?   **[118.6]**

12. 8954 ÷ (-32) = ?   **[-280 or -279.8]**

13. (56.2 ÷ 3.2) x (9.7 ÷ (-2.3)) = ?   **[-74.1]**

Take the C4 Quiz or review.

C5 LESSON: PERCENTAGE   %

We say X% (X Percent) of A is: (X/100)x A

30% of 100 is (30/100)x100 = .30 x 100 = 30

45% of 156 is (45/100)x156 = .45 x 156 = 70.2

There is a **%** Key on the TI 30XA.

It is above the **2** Key. Select **2nd** then the number **2** to get it.

    45 **2nd** **2** yields .45

So;   45 **2nd** **2** x 156 **=** 70.2

To add **X%** of A to A: A **+** X **2nd** **2** **=** (1 + X/100)A

Add 35% of 256 to itself: 256 **+** 35 **2nd** **2** **=** 345.6

There will be a deeper Lesson on Percentages, Discounts and Mark-ups in Tier 3 which goes into more detail on percentages.

This is just to show you how the % Key works.

PERCENTAGE %   Answers: [ ]'s

1. Where is the % key on the TI-30XA? [**Above the 2**]

2. How do you activate the % Function? [**Press the yellow 2nd**
Then the 2 key.

3. What is 45% of 156?   [**70.2**]

4. Enter 45   Display is ?   [**45**]
    Press **2nd 2** Key   Display is ?   [**0.45**]
    Press the **x** Key   Display is ?   [**0.45**]
    Enter 156   Display is ?   [**156**]
    Press **=** Key   Display is ?   [**70.2**]

5. What is 87% of 835?   [**726.45**]

6. Add 35% or 287 to itself.   [**387.45**]

7. Enter 287   Display is ?   [**287**]
    Press **+** Key   Display is ?   [**287**]
    Enter 35   Display is ?   [**35**]
    Press **2nd 2** Key   Display is ?   [**100.45**]
    Press **=** Key   Display is ?   [**387.45**]

8. 165% of 200 is?   [**330**]

9. Add 80% of 125 to itself and get?   [**225**]

10. 4% of 1000 is?   [**40**]

Take the C5 Quiz if ready,
or do more exercises, C5ES.

PERCENTAGE %   Answers: [ ]'s

1. What is 145% of 156?   [**226.2**]

2. Enter 145   Display is ?   [**145**]
   Press **2nd 2** Key   Display is ?   [**1.45**]
   Press the **x** Key   Display is ?   [**1.45**]
   Enter 156   Display is ?   [**156**]
   Press **=** Key   Display is ?   [**226.2**]

3. Enter 156   Display is ?   [156]
   Press **x** Key   Display is ?   [156]
   Enter 145   Display is ?   [145]
   Press **2nd 2** Key   Display is ?   [1.45]
   Press **=** Key   Display is ?   [226.2]

Do you see the two different ways?

4. What is 37**%** of 835?   [**309**]

5. What is 137**%** of 835   [**1144 = 835 + 309**]

6. Add 55**%** of 287 to itself.   [**444.85**]

7. Enter 287   Display is ?   [**287**]
   Press **+** Key   Display is ?   [**287**]
   Enter 55%   Display is ?   [**55**]
   Press **2nd 2** Key   Display is ?   [**157.85**]
   Press **=** Key   Display is ?   [**444.85**]

Make up some problems for yourself and take the C5 Quiz.

C6 LESSON: MEMORY M1, M2, M3   STO   RCL (   )

Sometimes you may need to store a number in the calculator to be recalled later.

STO and **RCL** do this.

There are three memory registers, **M1**, **M2**, and **M3**.

To store a number **N** in memory register **1** do this:

Enter **N**, then **STO 1** and **N** is stored in **M1**

Later to recall N: **RCL 1** will restore **N**.

Example: (3 x 4) + (5 x 7) + (4 x 8)

  3 x 4 = 12 **STO 1**,   5 x 7 = 35 **STO 2**,   4 x 8 = 32

  Now 32 + **RCL** 1 + **RCL 2 =** 79

Or use the **( )** keys: Simply duplicate the above.

Memory is used when you need to store a number for later use. Parenthesis are used for shorter term storage in a calculation.

For example, if you need to store someone's phone number; say, 5013452314, simply enter this and **STO 1**.

Now **RCL 1** will recall it anytime in the future even if you turn the calculator OFF. Only storing another number in **M1** will erase it.

MEMORY M1, M2, M3 STO RCL (   )

1. How many memory registers does the TI-30XA have?

2. Where do you see the **M1, M2,** and **M3** displayed?

3. Which keys do you use to store a number in memory **M2**?

4. Store 235 in **M2**.

5. How do you recall the number in stored in **M2**?

6. What number is in **M2**?

7. Do you lose the numbers stored in memory when you turn the calculator off?

8. How do you "clear" the memory register **M3**?

9. What can you also use for temporary memory storage when doing a calculation?

10. (12.3 + 87) x (34 + 56) = ?

Answers are on C6EA, page 24.

"Play" with the memory and ( ) until you are comfortable with them…then take the C6 Quiz.

MEMORY M1, M2, M3 STO RCL ( )   Answers: [ ]'s

1. How many memory registers does the TI-30XA have? [**3**]

2. Where are the **M1, M2** and **M3** displayed?   [**Upper Left**]

3. Which keys do you use to store a number in
    memory **M2**?   [**STO 2**]

4. Store 235 in **M2**.   [**Enter 235 press STO 2**]

5. How do you recall the number in stored in **M2**? [**RCL 2**]

6. What number is in **M2**?   [**235**]

7. Do you lose the numbers stored in Memory when you turn the
    calculator off?   [**No**]

8. How do you "clear" the memory register M3?
                                           [**Enter 0 Press STO 3**]

9. What can you also use for temporary memory storage when
    doing a calculation?   [**( )**]

10. (12.3 + 87) x (34 + 56) = ?   [**8937**]

**"Play" with the memory and ( ) until you are comfortable with
them…then take the C6 Quiz.**

C7 LESSON: X^2 SQUARE

Definition: $A^2 = A \times A$...we say: **A squared**

$5^2 = 5 \times 5 = 25$ $(7.4)^2 = 7.4 \times 7.4 = 54.8$

An easier way to get this is the $\underline{x}^2$ key

7.4$\underline{x}$2 yields 54.8 (or 54.76 depending on the **FIX**.)

This is handy for larger numbers.

543.7 squared is simply 543.7 $\underline{x}^2$ = 295609.69

You must supply the commas: 295,609.69

Very quick and easy and used a lot in practical math.

NOTE: $(-A)^2 = A^2$ -5 $\underline{x}^2$ = 25   So $\underline{x}^2$ result is always positive.

As usual, exercises and C7 Quiz.

X² SQUARE Answers: [ ]'s

1. What is the definition of A²? [**AxA**]

2. Where is the x² key on the TI-30XA? [**3 down middle**]

3. (137.4)² = ? [**18878.76 or 18,878.76**]

4. (6.2)² = ? [**38.44**]

5. (-8.7)² = ? [**75.69**]

6. (3.4 + 8.7)² = ? [**146.41**]

7. (5²)² = ? [**625**]

8. (78 ÷ 3.3)² = ? [**558.7**]

9. Can A² be negative? [**No**]

10. 7² - 3² = ? [**40**]

11. (((((2)²) ²) ²) ²)² = ? [**4,294,967,296**]

Play with x² Key until you have mastered it.

Take the C7 Quiz or practice some more with C7ES.

X^2 SQUARE   Answers: [ ]'s

1. $(92.56)^2$ = ?   [8567.35]

2. $(16.2)^2$ = ?   [262.4]

3. $(-75.7)^2$ = ?   [5730.5]

4. $(4.3 + 6.7)^2$ = ?   [121]

5. $(7^2)^2$ = ?   [2401]

6. $(478 \div 23.3)^2$ = ?   [420.9]

7. Can A^2 be 0?   [Yes, $0^2 = 0$]

8. 82 - 122 = ?   [-80]

9. $(((((2.05)^2)\ ^2)\ ^2)\ ^2)^2$ = ?   [9,465,063,976]

    Compare to #11 on previous page!

10. $(2\ 3/4)^2$ = ?   [7 9/16 = 121/16 = 7.5625]

Play with x^2 key until you have mastered it.
Take the C7 Quiz or review.

C8 LESSON: √x   SQUARE ROOT

Definition: $(\sqrt{A})^2 = A$

   $\sqrt{25} = 5$ since 52 = 25

The "problem" is given A, what is $\sqrt{A}$?

In the old days, this was a difficult problem and there was not an easy way to determine it. But, today thanks to the power tool of math, the calculator, it is very easy.

Just use the <u>√x</u> key.

   346 <u>√x</u> yields the answer 18.6

Also, note x^2 and $\sqrt{x}$ are "**inverses**."

This was revolutionary in the 1970's. It changed many ways we taught engineering and science subjects along with the trig functions.

NOTE: You may not take the square root of a negative number with this calculator. The square root of a negative number exists, but it is not a real number. It is called a complex or imaginary number and will require a more sophisticated power tool. <mark>See Tier 4.</mark>

For now, **-7** $\sqrt{x}$ yields an "Error" message.

As usual, Exercises and the C8 Quiz.

√**X**   **SQUARE ROOT**   Answers: [ ]'s

1. Define $\sqrt{A}$ $[(\sqrt{A})^2 = A]$

2. $\sqrt{36}$ = ?   [6]

3. $\sqrt{137}$ = ?   [11.7]

4. $\sqrt{19.4}$ = ?   [4.4]

5. $\sqrt{(5.4 + 87.2)}$ = ?   [9.6]

6. $(\sqrt{76})^2$ = ?   [76]

7. $\sqrt{(35)^2}$ = ?   [35]

8. $\sqrt{-73}$ = ?   [**Error**] Why?

9. $\sqrt{(\sqrt{98})}$ = ?   [3.15]

10. $\sqrt{98765432}$ = ?   [9938]

Play with √ until you are comfortable with it.

Take the C8 Quiz or do some more exercises, C8ES.

$\sqrt{X}$ **SQUARE ROOT**   Answers: [ ]'s

1. Define $\sqrt{A}$ $[\sqrt{A} \times \sqrt{A} = A]$

2. $\sqrt{256}$ = ?   [16]

3. $\sqrt{1,000,000}$ = ?   [1,000]

4. $\sqrt{1000}$ = ?   [31.6]

5. $\sqrt{1024}$ = ?   [32]

6. $(\sqrt{1776})^2$ = ?   [1776]

7. $\sqrt{(\sqrt{(\sqrt{(\sqrt{(\sqrt{4,294,967,296})}})}})}$ = ?   [2]

8. $\sqrt{-(-81)}$ = ?   [9]

9. $\sqrt{(\sqrt{81})}$ = ?   [3]

10. $\sqrt{987654321}$ = ? $[31427 \sim 10,000\pi]$

Play with $\sqrt{}$ until you are comfortable with it.

Take the C8 Quiz or review.

$1 \div x$ is called the "reciprocal." Thus, $1/5 = .2$.

Now the **1/x** Key makes calculating it easy.

       5 **1/x** yields .2

       7 **1/x** yields .142857143 or .143 or .14 (**FIX**)

  NOTE: 1/x is its own inverse;   N **1/x 1/x** yields N…You try it!

Homework and Quiz.

To recap our progress so far:

      +   -   x   ÷ x^2 $\sqrt{x}$ 1/x   =   are the eight **"work horse"** keys of practical math.

Learn them well. They are your friends.

The **( )** and **RCL** and **STO** will help sometimes.

So far, we have dealt only with real numbers expressed as base ten decimal numbers. This is often all you will ever need. But; sometimes, we express numbers as fractions. There are some wonderful keys that will help here too. (**See C10, C11, and C12**)

1/X   RECIPROCAL   "FLIP IT"   Answers: [ ]'s

1. Define 1/x $[1 \div x]$

2. 1/89 = ?   [0.011]

3. 1 ÷ 89 = ?   [0.011]

4. The reciprocal of 3 is ?   [1/3 = 0.33]

5. 1/1/79 = ?   [79]

6. 1/1/S = ?   [S]

7. 1/0.7 = ?   [1.429]

8. 1/0.07 = ?   [14.29]

9. 1/0.007 = ?   [142.9]

10. $1/(3^2 + 4^2)$ = ?   [0.04 or 1/25]

11. $\sqrt{[1/25]}$ = ?   [0.2]

12. $(1/25)^2$ = ?   [0.0016]

Play with 1/x

Take the C9 Quiz or do more exercises, C9ES.

1/X   RECIPROCAL "FLIP IT"   Answers: [ ]'s

1. 1/0 = ?   [Error]

2. 1/1 = ?   [1]

3. 1/0.5 = ?   [2]

4. 1/(1/2) = ?   [2]

5. 1/1/9 = ?   [9]

6. 1/1/A = ?   [A]

7. 1/(3 + 4) = ?   [0.14]

8. 1/√16 = ?   [0.25]

9. 1/(1 + 2 + 3) = ?   [1/6 = 0.166667]

10. 1/1/1/1/1/3 = ?   [0.3333]

11. 1/1/1/1/1/1/3 = ?   [3]

12. $(1/7)^2$ = ?   [0.02]

Play with 1/x
Take the C9 Quiz or review.

Let's quickly review fractions. Let A and B be two **integers**.
Then, A/B is called a **fraction**. If A > B then this fraction is
greater than 1 and called **improper**. There are four rules for
adding, subtracting, multiplying and dividing fractions you should
know.

A/B + C/D = (AD +BC)/BD

A/B - C/D = (AD -BC)/BD

A/BxC/D = AC/BD

(A/B)/(C/D) = A/B**x**D/C

2/3 + 4/5 = (2**x**5 + 3**x**4)/3**x**5 = (10+12)/15 =
22/15 = 1 7/15

The $\underline{a^{b/c}}$ lets you enter the two fractions and add them. Watch
the video to see how.

Similarly you can subtract, multiply, and divide two fractions.
See the video. **Do the homework**.

The largest denominator you may enter is 999. So, if you should
multiply two fractions resulting in a denominator greater than
999, the answer will be in decimal form.

Also, you may apply the other function keys to fractions just like
any other number.

FRACTIONS   a$^{b/c}$ + - X ÷ 1/X   Answers: [ ]'s

1. 3/4 + 7/8 = ?   [1 5/8 = 13/8 = 1.625]

2. 7/8 - 2/3 = ?   [5/24]

3. 2/3x4/5 = ?   [8/15]

4. 5/6 ÷ 2/3 = ?   [1 1/4 = 5/4 = 1.25]

5. -5/6 x 2/3 = ?   [-5/9]

6. -3/4 x -2/3 = ?   [1/2]

7. 1/(2/3) = ?   [1.5 = 1 1/2 = 3/2]

8. (6/7)² = ?   [0.734693878 = 36/49]

9. √(5/6) = ?   [0.91287]

10. What is largest denominator you can enter for a fraction with
    the TI 30 XA?   [999]

11. 17/8 + 13/3 = ?   [6 11/24 = 155/24 = 6.46]

12. 5/6 ÷ 7/9 = ?   [1 1/14 = 15/14 = 1.07]

Play with fractions.

Take the C10 Quiz or do more exercises, C10ES.

FRACTIONS   a$^{b/c}$ + - X ÷ 1/X   Answers: [ ]'s

1. 3/7 + 7/8 = ?   [1 17/56 = 73/56 = 1.30]

2. 7/8 - 5/6 = ?   [1/24]

3. 2/3 x 2/5 = ?   [4/15]

4. 5/9 ÷ 2/3 = ?   [5/6]

5. -5/6 x 4/3 = ?   [-1 1/9 = -10/9 = -1.11]

6. -5/4 x -2/3 = ?   [5/6]

7. 1/(2/7) = ?   [3.5 = 3 1/2 = 7/2]

8. (5/7)² = ?   [25/49 = 0.51]

9. √(4/7) = ?   [0.756]

10. What is largest denominator you can enter for a fraction with
    the TI 30 XA?   [999]

11. 1 7/8 + 2 3/4 = ?   [4 5/8]

12. 5/8 ÷ 7/12 = ?   [1.07 = 15/14 = 11/14]

Play with fractions.

C11 LESSON: D/C   PROPER / IMPROPER FRACTION

"d/c" is a yellow "key" seen above the $a^{b/c}$ key. You get to it by selecting **2ⁿᵈ a^{b/c}**.

If A < B,   A/B is called a proper fraction.   (6/8)

If A > B,   A/B is called an improper fraction. (8/6)

A Mixed Fraction is an integer plus a fraction like 23/4.

If A and B share no common factor we say A/B is reduced to lowest terms.   6/8 = 3/4 in lowest terms.

The d/c Key does this plus more. It is **2nd a^{b/c}**.

Enter 23/6 as a mixed fraction (watch video)

Hit the d/c Key and get 15/6…**again**…21/2…**again**…5/2.

So you first get an improper, then mixed lowest terms and then improper lowest.

Play with it. Do some homework problems. Have fun.

Remember…largest denominator is 999, otherwise will convert automatically to decimal. (See next Lesson, C12)

D/C PROPER/IMPROPER FRACTION   Answers: [ ]'s

1. Where is the "d/c" Key or Function?   [2nd ab/c]
   Express the answer as an improper fraction and a mixed fraction.

2. 3/4 + 4/5 = ?   [**31/20** = **1** 11/20]

3. 2/3 ÷ 4/7 = ?   [**7/6** = **1** 1/6]

4. 1 2/3 + 3 3/4 = ?   [**65/12** = **5** 5/12]

5. 6 7/8 − 2 2/3 = ?   [**101/24** = **4** 5/24]

6. (2 3/4)^2 = ?   [**121/16** = **7** 9/16 = **7.5625**]

7. -(6/7) x 13/8   [**-39/28** = **-1** 11/28]

8. 2 x 4 3/4 = ?   [**19/2** = **9** 1/2]

9. 15/7 + 2 3/4 + 12/5 = ?   [**1021/140** = **7** 41/140]

10. 2 3/4 ÷ 15/7 = ?   [**77/60** = **1** 17/60]

11. √(7/4 - 5/13) = ?   [**1.17**]

12. √(3^2 + 4^2) = ?   [**5**]

NOTE: In Question 6, the answer is 7.5625. In Lesson 12, you will learn how to convert 79/16 to a decimal.

Take the C11 Quiz or do more exercises, C11ES

D/C PROPER/IMPROPER FRACTION   Answers: [ ]'s

1. Where is the "F <--> D" Key or Function?

   [**2nd <-----**] [**Lower Left Corner**]

   Express the answer as an improper fraction and a mixed fraction.

2. $3/7 + 17/21 = ?$ [1 5/21 = 26/21]

3. $2/3 \div 2/7 = ?$ [2 1/3 = 7/3]

4. $2\ 2/3 + 5\ 3/4 = ?$ [8 5/12 = 101/12]

5. $4\ 7/8 - 2\ 2/5 = ?$ [2 19/40 = 99/40]

6. $(2\ 3/5)^2 = ?$ [6 19/25 = 169/25 = 6.76]

7. $-(6/7) \times 1\ 3/8$ [-1 5/28 = -33/28]

8. $3.5 \times 3\ 3/5 = ?$ [12 3/5 = 63/5]

9. $1\ 5/7 + 2\ 3/4 + 12/5 = ?$ [6 121/140 = 961/140]

10. $3\ 3/4 \div 13/7 = ?$ [2 1/52 = 105/52]

11. $\sqrt{(17/5 - 2/13)} = ?$ [1.8]

12. $\sqrt{\{(1/3)^2 + (1/4)^2)\}} = ?$ [0.417 = 5/12]

NOTE: In Question 6, the answer is 6.76. In Lesson 12, you will learn how to convert 169/25 to a decimal.

Take the C11 Quiz or review.

C12 LESSON: F ↔ D   FRACTION TO DECIMAL CONVERSION

Any fraction can be converted to a decimal, although sometimes it will only be an approximation.

> 1/2 = .5 exactly, 1/3 = .3333 approximately.

This can be accomplished automatically with the **F ↔ D** yellow "Key" via **2nd** ← .

2/3 **F ↔ D** .66667 depending on the **FIX**.

F ↔ D again and you get 2/3 back.

Warning. If you enter .66667 and then **F ↔ D**, nothing will happen…no fraction. **F ↔ D** only works when you **start** with a fraction.

So, it is convenient when you want to end up with a decimal.

Ex: 8/15 **+** 9/17 = 116/255… you want the decimal equivalent.

Just **F ↔ D** and get 1.06275 (depending on **FIX**)

Also, you can go back, and then use **d/c** to get 271/255.

Again, **have fun** with some homework and it will soon be very easy to use these three keys. Even if you can "do" fractions manually, this will be much faster and more error free. That's the point of a "power tool."

F ↔ D   FRACTION TO DECIMAL CONVERSION
Answers: [ ]'s

1. Where is the **F ↔ D** "Key" or Function?
   [**2nd ← Bottom Left of Keypad**]

2. Convert 3/7 to decimal   [**0.4286**]

3. Convert .375 to fraction   [**3/8**]

4. Convert 1/3 to decimal   [**0.33333333**]

5. Convert 0.33 to fraction   [**33/100**]

6. Convert 0.333 to fraction   [**0.333**]

7. What Happened? Why not 1/3?
   [**Denominator would be 1000, larger than 999**]

8. What is largest denominator you can enter?   [**999**]

9. Can you get 3/250 + 4/7 in fraction form?
   [**No, not with the TI 30 XA.**
   (3x7 + 4x250)/1750 = 1021/1750 = 0.5834]

10. Convert 568/126 to improper fraction in lowest terms.
    [**284/63**]

Take C12 Quiz or do some more exercises, C12ES.

F ↔ D FRACTION TO DECIMAL CONVERSION
Answers: [ ]'s

1. Convert 7/3 to decimal   [**2.33**]

2. Convert 3/8 to decimal   [**0.375**]

3. Convert 0.385 to fraction   [**77/200**]

4. Convert 2 1/3 to decimal   [**2.333**]

5. Convert 3 1/7 to decimal   [**3.1428**]

6. Convert 0.044 to fraction   [**11/250**]

7. Convert 0.0444 to fraction   [**0.0444**]

8. What Happened?   [**Too large a denominator**]

9. What is largest denominator for the TI 30XA?   [**999**]

10. Can you get 3/250 + 4/7 in fraction form?   [**No**]

11. Convert 476/252 to improper fraction in lowest terms.
                                        [**17/9**]

Take the C12 Quiz or review.