

## Comparing and Ordering Numbers

ID: 11191

 Time required  
 45 minutes

### Activity Overview

*In this activity, students will explore numbers and number representations for fractions, decimals, and percents. They will use a number line to compare and order numbers.*

### Topic: Numbers and Operations

- *Understanding numbers, representing numbers, and understanding relationships among numbers*
- *Comparing and ordering fractions, decimals, and percents*
- *Using a number line to compare and order numbers*

### Teacher Preparation and Notes

- *Before beginning the activity, students should clear all lists and turn off functions. To clear the lists, press **2nd** **0** and scroll down until the arrow is in front of **ClrAllLists**. Press **ENTER** twice. To clear any functions, press **Y=** and then press **CLEAR** when the cursor is next to Y1 through Y4.*
- *Students should have prior experience with converting decimals, fractions, and percents.*
- *TI-Navigator is not required for this activity, but an extension is given for those teachers that would like to use it.*
- ***To download the student worksheet, calculator files, and TI-Navigator files, go to [education.ti.com/exchange](http://education.ti.com/exchange) and enter "11191" in the quick search box.***

### Associated Materials

- *L1.73I (list for Problem 1)*
- *MGAct01\_OrderNumbers\_worksheet\_TI-73.pdf*
- *MGAct01\_Fraction\_Nav\_TI-73.act*
- *MGAct01\_Decimal\_Nav\_TI-73.act*

### Suggested Related Activities

*To download any activity listed, go to [education.ti.com/exchange](http://education.ti.com/exchange) and enter the number in the quick search box.*

- *Comparing and Ordering (TI-73 Explorer) — 6670*
- *Comparing Decimals (TI-73 Explorer) — 4210*

**Problem 1 – Ordering Fractions and Decimals**

Send **L1** to students, or use the overhead calculator to show the list to the students.

Question 1

Assign each student one of the numbers in the list. They should write this on a piece of paper or give them a sticky note with the number on it.

Have the students come to the front of the class and order themselves from least to greatest. After all students feel the list is in order from least to greatest, use the **SortA**( command on the Home screen to sort the list in ascending order.

The key presses on the Home screen are **2nd** **LIST** **▸** **ENTER** **2nd** **LIST** **ENTER** **▸** **ENTER**. Then, look at the list again, **LIST**, and the list will be in ascending order.

L1	L2	L3	1
2/3	-----	-----	
.6			
.75			
3/4			
.245			
.25			
1/3			
L1 = {2/3, .6, .75, ...			

SortA(L1)	Done
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Question 2

Students may just look at the fractions and decimals and convert each to see if there is an equivalent.

To use the technology, students could convert **L1** from fractions (or decimals) to decimals (or fractions) and then store in **L2** in order to compare.

Key presses on the Home screen to convert the list and store it again are, **2nd** **LIST** **ENTER** **F↔D** **STO▸** **2nd** **LIST** **▾** **ENTER** **ENTER**. To see **L2** beside **L1**, press **LIST**.

Here students can see that 0.75 and  $\frac{3}{4}$  are equivalent.

L1 → F↔D → L2
{49/200 1/4 .33...

L1	L2	L3	2
.245	49/200	-----	
.25	1/4		
1/3	.33333		
.6	3/5		
2/3	.66667		
3/4	.75		
.75	3/4		
L2(1) = 49/200			

**Problem 2 – Fraction Challenge**

Allow students to challenge each other to find fractions between two given decimals.

Arrange students in pairs. One partner will pick two decimals. The other partner will then write a fraction that is between the two decimals.

Do this for 2 (or more) sets of decimals and fractions. Then have the partners switch roles. Repeat for 2 more sets of numbers.

After at least 4 sets of numbers have been generated, students enter them into a list, such as **L1**, in order from least to greatest.

**Note:** If students want to clear existing lists, press **2nd** **LIST** **6** **ENTER**.

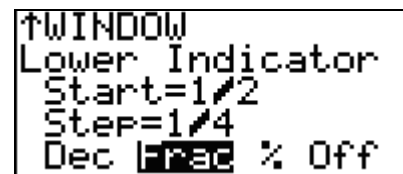
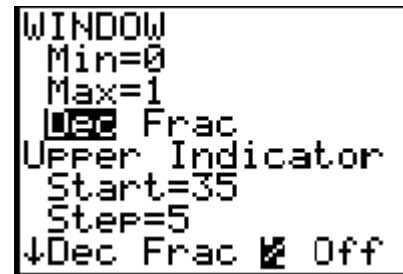
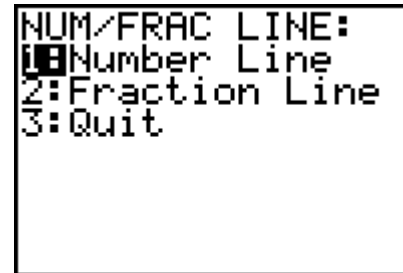


### Problem 3 – Number Line App

For this part of the activity, the screenshots on the worksheet do not need to be replicated. However, if you wish to give more examples, or to let the students explore on their own, here are the key presses for starting the **Number Line App** and changing the settings.

First, make sure you have the Number Line App installed. Press **APPS** and scroll down to **NUMLINE** and press **ENTER**. Press any key to make the opening screen disappear.

Choose **Fraction Line**. Press **WINDOW** to and make changes as needed. Window refers to the area you see left to right on the fraction line. *Upper Indicator* refers to the top side of the fraction line. Pressing the down arrow will move to the *Lower Indicator* which refers to the bottom side of the fraction line. Press **GRAPH** to return to the fraction line.

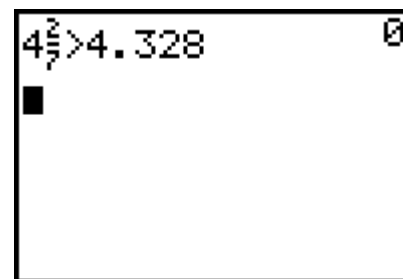


### Problem 4 – Solve a Similarity Problem

Students can solve these true/false statements in other ways as well. This method is showing them the Boolean tests that will likely prove useful in future mathematics studies. The **<** and **>** symbols can be entered using the **Text** menu.

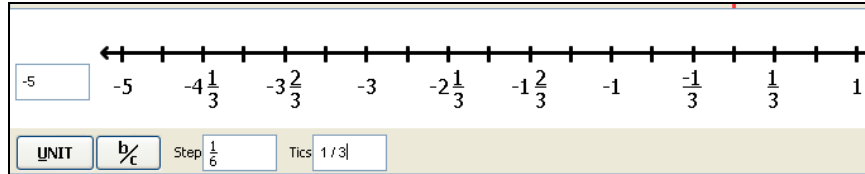
Key presses for Exercise 10 are enter the first number **4** **UNIT** **2** **b/c** **7** **2nd** **MATH**. Then scroll to **>**, **ENTER**, scroll to **Done**, **ENTER**. Enter the second number **4** **.** **3** **2** **8** and press **ENTER**.

**Note:** The calculator returns either 0 or 1 for Boolean test, true or false. True = 1 and False = 0.



**Extension – TI-Navigator™**

1. Have each student enter a list of 6 numbers into L1 that the class will then order. You may want to assign different rows (or individual students) a minimum and maximum, between  $-4$  and  $0$  for example. Once students have entered their lists, use the **Screen Capture** feature of TI-Navigator to pull one student’s screen at a time (not the whole class). Have a volunteer put the numbers in order from least to greatest or greatest to least.
2. Load the **Activity Center settings** for either decimal or fraction. See *MGAct01\_Fraction\_Nav\_TI-73.act* (or *MGAct01\_Decimal\_Nav\_TI-73.act*)



You can adjust the **Configuration** as desired as well as the **Step** and Tic marks (**Tics**). If you change the step or tic marks to decimals, the number line will change to show decimals.

3. To use data from the students, you can ask them to convert their birthday (month and day) into a fraction,  $\frac{\text{day}}{\text{month}}$ . Then, display a number line using TI-Navigator and have the students place their birthday on the number line. Have students give you the best maximum, minimum, and step for them to place these fractions on the number line. ( $\frac{31}{1}$ , Jan 31, could be the maximum and  $\frac{1}{12}$ , Dec 1, could be the minimum)
4. Use **Quick Poll** to ensure students understanding. The prompt can be “Which is greater?” and then give students multiple pairs of number.

$\left(\frac{1}{3}\right)$  or  $\frac{1}{4}$

$(75\%)$  or  $\frac{1}{4}$

$\left(\frac{7}{8}\right)$  or  $.80$

$-1\frac{2}{3}$  or  $(-1.40)$

**Solutions to Student Worksheet**

Problem 1

1. 0.75 or  $\frac{3}{4}$ ; 0.245

2. 0.75 or  $\frac{3}{4}$

Problem 2

3. Answers will vary. Check students' work.
4. Answers will vary. Check students' work.
5. Answers will vary. Check students' work.

Problem 3

6. Answers will vary. Fraction should be between  $-1$  and  $-0.6$ .
7. Answers will vary. Decimal should be between  $\frac{5}{6}$  and  $1\frac{1}{3}$ .
8. Answers will vary. Fractions should be between  $-\frac{1}{4}$  and  $\frac{1}{4}$ .
9. Answers will vary. Decimal should be between 35% and  $\frac{1}{2}$ .

Problem 4

10. False
11. False
12. True
13. False
14. True
15. True
- 16.

