

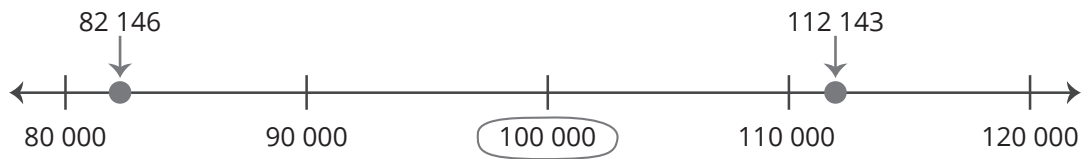
3 Comparing and Ordering Six-Digit Numbers

Comparing Whole Numbers With Different Numbers of Digits

You can compare whole numbers with different numbers of digits in various ways.

You could use a benchmark number to compare two numbers.

For example:

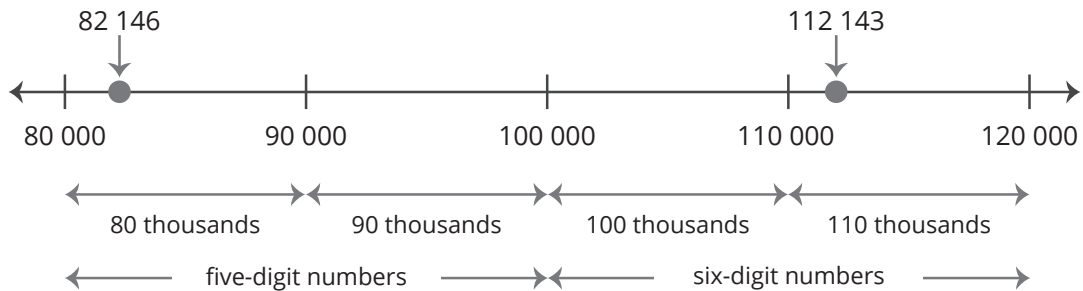


$$82\ 146 < 100\ 000 \text{ and } 100\ 000 < 112\ 143, \\ \text{so } 82\ 146 < 112\ 143.$$

- You could count digits; for example, a five-digit whole number is always less than a six-digit whole number.

The strategy of counting digits can be explained using place-value ideas.

For example, 82 146 is a number in the 80 thousands and 112 143 is in the 110 thousands, so 82 146 is less than 112 143. This number-line model shows why:



A number in the 80 thousands is less than a number in the 110 thousands.

Comparing Whole Numbers With the Same Numbers of Digits (continued)

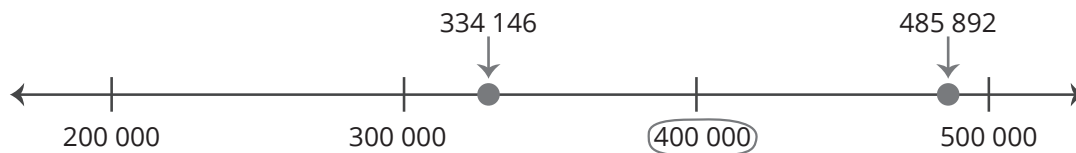
Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
● ● ● 3	● ● ● 3	○ ○ ○ ○ 4	○ 1	○ ○ ○ ○ 4	○ ○ ○ ○ ○ ○ 6
● ● ● 3	● ● ● ● ● ● 8	○ ○ ○ ○ ○ ○ 5	○ ○ ○ ○ ○ ○ 8	○ ○ ○ ○ ○ ○ ○ ○ 9	○ ○ ○ ○ 2

$385\,892 > 334\,146$

- Alternatively, you could use the benchmark strategy.

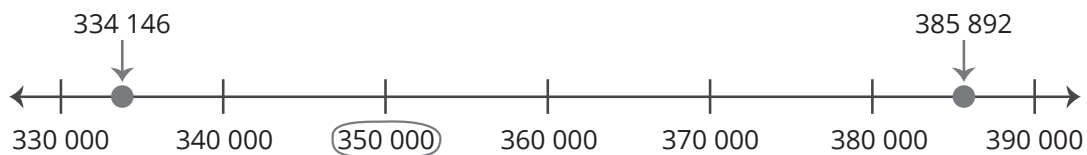
For example:

- To compare 334 146 and 485 892, you might use the benchmark 400 000.



$334\,146 < 400\,000$ and $400\,000 < 485\,892$,
so $334\,146 < 485\,892$.

- To compare 334 146 and 385 892, you might use 350 000.



$334\,146 < 350\,000$ and $350\,000 < 385\,892$,
so $334\,146 < 385\,892$.

Ordering Numbers

There are different ways to order a set of numbers.

- You usually compare numbers two at a time, using the strategies shown above.

For example, to order 376 245, 876 398, and 683 256:

You could compare 376 245 and 876 398, $\underline{3}76\ 245 < \underline{8}76\ 398$

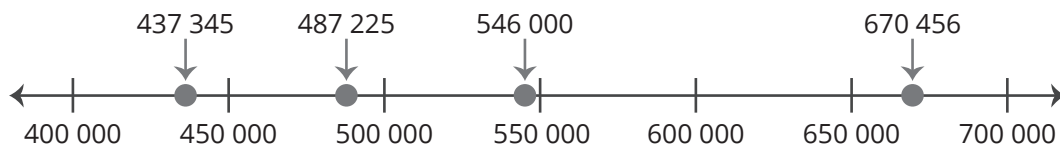
then compare 376 245 and 683 256, and $\underline{3}76\ 245 < \underline{6}83\ 256$

then compare 876 398 and 683 256. $\underline{6}83\ 256 < \underline{8}76\ 398$

So, $376\ 245 < 683\ 256 < 876\ 398$.

- You could also use multiple benchmarks and a number line.

For example, you could order 487 225, 670 456, 546 000, and 437 345 by placing them on a number line, using the increments along the number line as benchmarks.



Once all the numbers have been placed on the number line, they are in order.

Definitions

benchmark (number): a familiar number that can be used to understand the size of a number, to estimate a number, or to compare numbers, such as 100 000, 250 000, and 500 000

digit: one of the ten symbols (0, 1, 2, 3, 4, 5, 6, 7, 8, and 9) used to create numerals; for example, the digits 1, 2, 3 make up the numeral 123

place value: the value of a digit in a numeral based on its position; for example, the 7 in $\underline{7}24$ has a value of 7 tens, or 70