Ordering positive and negative integers

A more negative number is smaller than a less negative number (look at the number line). So -9 is a smaller number than -3.

Example: put the following numbers in ascending order:
-10, -12, 4, 1, -2, 8, 5, 7

Answer
-12, -10, -2, 1, 4, 5, 7, 8

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smaller integers ←———————— ————————→ bigger integers

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
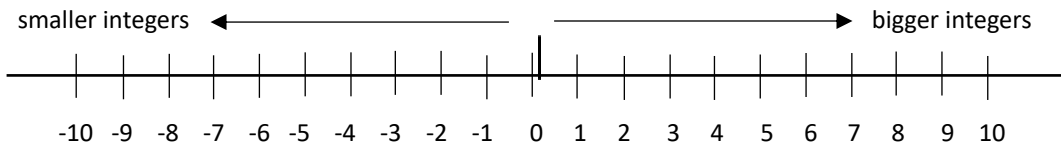
Some useful fractions and their equivalent decimals include:
$\frac{1}{2} = 0.5$, $\frac{1}{4} = 0.25$, $\frac{3}{4} = 0.75$ $\frac{1}{10} = 0.1$, $\frac{2}{10} = 0.2$, $\frac{3}{10} = 0.3$
Note: when the denominator is 10 simply divide numerator by 10 (move decimal 1 place to left).

Use of mathematical symbols: = equals, ≠ not equal to, > greater than, < less than, ≥ greater than or equal to, ≤ less than or equal to. Examples: Use the correct symbol between the following numbers a) -4 ☐ 3, b) 5 ☐ 2 c) 0.702 ☐ 0.722 d) ⅖ ☐ 0.4 e) state the meaning of $x \geq 2$
Answers: a) -4 < 3 b) 5 > 2 c) 0.702 < 0.722 d) ⅖ = 0.4 e) x is greater than or equal to 2

Ordering decimals and fractions

Other useful fractions and their equivalent decimals:

$\frac{1}{5} = 0.2$, $\frac{2}{5} = 0.4$, $\frac{3}{5} = 0.6$, $\frac{4}{5} = 0.8$

Example: put the following numbers in ascending order:
$\frac{4}{5}$, 0.3, $\frac{1}{2}$, $\frac{2}{5}$, 0.2, $\frac{1}{10}$
Answer
$\frac{1}{10}$, 0.2, 0.3, $\frac{2}{5}$, $\frac{1}{2}$, $\frac{4}{5}$

Exercise 1 Ordering positive and negative integers

1. Write the following integers in order of size starting with the smallest:
   a. 25, 42, 15, 6, 9, 5, 19, 10
      5, 6, 9, 10, 15, 19, 25, 42
   b. 112, 76, 99, 108, 102, 206, 58, 29
      29, 58, 76, 99, 102, 108, 112, 206
   c. 4, -8, -2, -4, -6, -10, 12, 7, 6, 9
      -10, -8, -6, -4, -2, 4, 6, 7, 9, 12
2. Write the following numbers in ascending order:
   a. -233, -450, -302, -304, -150, -160, -75, 0
      -450, -304, -302, -233, -160, -150, -75, 0
   b. 1006, 1001, 2001, -1, 400, 2022, -10000, -40
      -10000, -40, -1, 400, 1001, 1006, 2001, 2022
   c. 33, 84, 24, 26, 44, 56, 98, 25, 15, 8
      8, 15, 24, 25, 26, 33, 44, 56, 84, 98
3. List the following in descending order:
   a. 85, 91, 72, 64, 28, 51, 88, 98
      98, 91, 88, 85, 72, 64, 51, 28
   b. 2000034, 2000555, 2001555, 2000553
      2001555, 2000555, 2000553, 2000034
   c. -15, -19, -13, -5, -11, -6, -2, -1
      -1, -2, -5, -6, -11, -13, -15, -19

Exercise 2 Use of mathematical symbols

1. Use the correct mathematical symbol between the following numbers:
   a. -2 ☐ 0   -2 < 0
   b. 4 ☐ 0   4 > 0
   c. 4 ☐ -2   4 > -2
   d. 5 ☐ 3   5 > 3
   e. -6 ☐ -7   -6 > -7
   f. -8 ☐ -3   -8 < -3
   g. 7 ☐ 10   7 < 10
   h. 1.10 ☐ 1.11   1.10 < 1.11
2. Write statements to express the following:
   a. $x \geq 4$ x is greater or equal to 4
   b. $x < 1$ x is less than 1
   c. $x \leq -3$ x is less than or equal to -3
   d. $-2 \leq x \leq 4$ x between -2 and 4 inclusive

3. Use mathematical symbols to express the following:
   a. x is greater but not equal to 5 $x > 5$
   b. x is less than or equal to -2 $x \leq -2$
   c. x is greater or equal to 7 $x \geq 7$
   d. x has values between 1 and 3 inclusive
      $1 \leq x \leq 3$

Exercise 3 Ordering decimals and fractions

1. Put the following fractions in ascending order:
   a. 3/10, 1/5, 1/10, 3/5, 7/10
      1/10, 1/5, 3/10, 3/5, 7/10
   b. 6/7, 4/5, 9/10, ½, 6/10
      ½, 6/10, 4/5, 6/7, 9/10
   c. 2/3, 3/5, 5/6, ¾, 1/3

2. Put the following decimals in ascending order:
   a. 0.233, 0.123, 0.323, 0.203, 0.332
      0.123, 0.203, 0.233, 0.323, 0.332
   b. 4.551, 4.550, 4.450, 4.451, 4.505
      4.450, 4.451, 4.505, 4.551, 4.550
   c. 0.0409, 0.0419, 0.0410, 0.0411
      0.0409, 0.0410, 0.0411, 0.0419
3. Place the following decimals/fractions in descending order:
   a. ½, 0.49, 0.55, 0.65, 3/5, 2/5, 0.81, 4/5
      0.81, 4/5, 0.65, 3/5, 0.55, ½, 0.49, 2/5
   b. 0.75, 2/3, 4/7, 5/6, 0.9, 19/20
      19/20, 0.9, 5/6, 0.75, 2/3, 4/7
   c. 13/15, 13/16, 13/14, 13/18, 13/17, 13/19
      13/14, 13/15, 13/16, 13/17, 13/18, 13/19