# Just In Time Quick Check

## Standard of Learning (SOL) 8.1

**Strand:** Number and Number Sense

### Standard of Learning (SOL) 8.1

***The student will compare and order real numbers.***

### Grade Level Skills:

- Compare and order no more than five real numbers expressed as integers, fractions (proper or improper), decimals, mixed numbers, percents, numbers written in scientific notation, radicals, and π. Radicals may include both positive and negative square roots of values from 0 to 400. Ordering may be in ascending or descending order.
- Use rational approximations (to the nearest hundredth) of irrational numbers to compare and order, locating values on a number line. Radicals may include both positive and negative square roots of values from 0 to 400 yielding an irrational number.

### Just in Time Quick Check

### Just in Time Quick Check Teacher Notes

### Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - 8.1 - Ordering Numbers (Word) / PDF Version
- VDOE Algebra Readiness Formative Assessments
  - SOL 8.1 (Word) / PDF
- VDOE Algebra Readiness Remediation Plans
  - Zero, Half, Whole? (Word) / PDF
  - Index Card Game (Word) / PDF
- VDOE Word Wall Cards: Grade 8 (Word) | (PDF)
  - Comparing Real Numbers
- Other VDOE Resources
  - 8.1 – Building A Number Line [eMediaVA]
- Desmos Activity
  - 8.1 - Polygraph: Rational Numbers
  - 8.1 - Fractions, Decimals Repeat

**Supporting and Prerequisite SOL**: 8.3a, 8.3b, 7.1b, 7.1c, 7.1d, 6.2a, 6.2b, 6.3b, 6.4

# SOL 8.1 - Just in Time Quick Check

1) Arrange the five numbers shown from least to greatest.

$$-\sqrt{36}, \qquad 3.2 \times 10^2, \qquad 4.34 \times 10^1, \qquad 125\%, \qquad -\frac{9}{2}$$

_____, _____, _____, _____, _____

2) Arrange the four numbers shown from greatest to least.

$$-2.45, \qquad -\frac{5}{8}, \qquad -2\frac{3}{5}, \qquad -0.8$$

_____, _____, _____, _____

3) Arrange the numbers shown in descending order.

$$3\frac{9}{12}, \qquad \frac{13}{4}, \qquad 312\%, \qquad 4.2 \times 10^{-2}, \qquad \pi$$

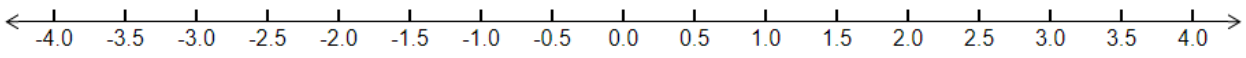
_____, _____, _____, _____, _____

4) Determine if the following statements are true or false. Justify your reasoning for each statement.

| Statement | True or False | Justify Reasoning |
|---|---|---|
| $2.47\% = 2.47$ | | |
| $2.\overline{7} > 2\frac{7}{10}$ | | |
| $0.312 < 31.2\%$ | | |

5) Place each number on the number line below.

$$-\pi, \qquad -\sqrt{7}, \qquad -\frac{17}{9}, \qquad 2.1 \times 10^{-1}$$



# SOL 8.1 - Just in Time Quick Check Teacher Notes

## Common Errors/Misconceptions and their Possible Indications

1) Arrange the four numbers shown from least to greatest.

$$-\sqrt{36}, \qquad 3.2 \times 10^2, \qquad 4.34 \times 10^1, \qquad 125\%, \qquad -\frac{9}{2}$$

_____, _____, _____, _____, _____

*A common error that students may make is comparing only the decimal portion of the two numbers in scientific notation and ignoring the powers of ten. This may indicate that students have not yet developed an understanding of the relationship between scientific notation and standard notation. A possible strategy to assist students in developing this relationship is to have students compare the exponents first and determine the correct order needed. Students would benefit from more practice converting numbers in scientific notation into standard notation; using the standard notation to compare; writing them back in scientific notation; and, then noticing patterns in the exponents once they are in order.*

*Another common error students may make is ignoring the negative before $-\frac{9}{2}$ and/or $-\sqrt{36}$ and treating it as a positive number. This error may indicate a need to revisit comparing integers. Teachers are encouraged to refer to the Grade 6 Curriculum Framework (see SOL 6.3b).*

*Another common misconception that students may have is thinking that 125% is 0.125. This may indicate a need to revisit converting between percents and decimals. Teachers are encouraged to refer to the Grade 6 Curriculum Framework (see SOL 6.2a).*

2) Arrange the four numbers shown from greatest to least.

$$-2.45, \qquad -\frac{5}{8}, \qquad -2\frac{3}{5}, \qquad -0.8$$

_____, _____, _____, _____

*A common misconception that students may have is thinking that $-2\frac{3}{5}$ is the greatest value because it has the largest absolute value and/or the student treats the numbers as if they are all positive. This may indicate a need to revisit comparing integers. Teachers are encouraged to refer to the Grade 6 Curriculum Framework (see SOL 6.3b).*

*Another misconception that student may have is thinking that $-2\frac{3}{5}$ is equal to -2.35 and therefore greater than -2.45. This may indicate a need for students to have additional practice with fraction and decimal equivalents. Students may benefit from using fraction circles, equivalency tiles or cubes, and/or number lines to identify equivalent forms of a number.*

3) Arrange the numbers shown in descending order.

$$3\frac{9}{12}, \qquad \frac{13}{4}, \qquad 312\%, \qquad 4.2 \times 10^{-2}, \qquad \pi$$

_____, _____, _____, _____, _____

*A common misconception students may make is confusing the vocabulary words ascending and descending. If students list the values in order from greatest to least, it may indicate a need to revisit vocabulary. Consider exploring the words ascending and descending in a real world context such as when a plane takes off, it ascends into the air and then descends to land.*

*Another common error students may make is converting* $4.2 \times 10^{-2}$ *to 420. This misconception may indicate a need for a deeper understanding of scientific notation, powers of ten, and multiplication of whole numbers and decimals. It may be helpful for to guide students to rewrite the power of ten as a whole number or decimal number and then use multiplication to determine the equivalent standard notation. Students may also benefit from looking at patterns of powers of ten multiplied by the same factor. For example,* $3.21 \times 10^0 = 3.21, 3.21 \times 10^1 = 32.1, 3.21 \times 10^2 = 321$ *and so on.*

4) Determine if the following statements are true or false. Justify your reasoning for each statement.

| Statement | True or False | Justify Reasoning |
|---|---|---|
| $2.47\% = 2.47$ | | |
| $2.\overline{7} > 2\frac{7}{10}$ | | |
| $0.312 < 31.2\%$ | | |

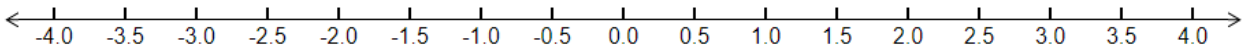
*Statement* $2.47\% = 2.47$ *: A common error students may make is saying these statements are true because they ignore the percent symbol. This may indicate a need to revisit converting between percents and decimals. Teachers are encouraged to refer to the Grade 6 Curriculum Framework (see SOL 6.2a).*

*Statement* $2.\overline{7} > 2\frac{7}{10}$ *: A common error students may make is saying these statements are equal because they ignore the repeating symbol over the 7 in* $2.\overline{7}$*. This misconception may indicate that a student has not yet developed an understanding of comparing decimal numbers. Teachers may want to provide students with grid paper or a place value chart to ensure that students align the numbers by the appropriate place value in order to compare them. With grid paper, this can be done by stacking each value in different rows and aligning the decimal points on one vertical line.*

*Statement* $0.312 < 31.2\%$*: A common error students may make is thinking* $31.2\%$ *is equivalent to 3120 because they moved the decimal point the wrong way. This may indicate that students need more practice converting between percents and decimals and understanding that percent means part of 100. Students may benefit from additional practice representing decimals and percents on a 10 by 10 grid.*

5) Place each number on the number line below.

$$-\pi, \quad -\sqrt{7}, \quad -\frac{17}{9}, \quad 2.1 \times 10^{-1}$$




*A common misconception students may have is placing $-\pi$ at positive 3.14 or $-\sqrt{7}$ at positive 2.65. This may indicate that students need additional practice using rational approximations of irrational numbers to locate values on a number line. Teachers may want to provide students additional practice with identifying irrational numbers on a number line.*

*Another possible error students may make is incorrectly converting $2.1 \times 10^{-1}$ to $-0.21$ or $-2.1$. This may indicate that students need additional practice converting scientific notation. See question 1 paragraph 3 for information about this misconception.*