Name _____ Date _____ Class _____

SKILL 16: Defining and Comparing Rational Numbers

Rational numbers are numbers that can be written as a ratio of two integers. The denominator can not be zero. Some examples of rational numbers are $\frac{-2}{3}$, $\frac{5}{8}$, $\frac{12}{-7}$, and $\frac{47}{100}$.

Some numbers that at first might not look like rational numbers actually are rational numbers, because they can be written as equivalent fractions with numerators and denominators that are integers. For example, $-\frac{3}{5} = \frac{-3}{5}$, $1.25 = \frac{5}{4}$, and $-0.\overline{3} = \frac{-1}{3}$.

Example 1

Show that each number is a rational number by writing an equivalent fraction with a numerator and a denominator that are both integers.

a. $-4\frac{1}{6}$

$-4\frac{1}{6} = -\frac{25}{6} = \frac{-25}{6}$

So $-4\frac{1}{6}$ is a rational number.

b. -0.125

$-0.125 = -\frac{125}{1{,}000} = \frac{-1}{8}$

So -0.125 is a rational number.

You can compare rational numbers in much the same way as you compare fractions, decimals, and integers.

Example 2

Compare $-1\frac{3}{5}$ and $-2\frac{1}{2}$.

Write the rational numbers using the positive common denominator 10.

$-1\frac{3}{5} = \frac{-8}{5} = \frac{-16}{10}$ $\quad -2\frac{1}{2} = \frac{-5}{2} = \frac{-25}{10}$

Compare the numerators. Since $-16 > -25$, you know that $\frac{-16}{10} > \frac{-25}{10}$.

So, $-1\frac{3}{5} > -2\frac{1}{2}$.

Guided Practice

1. Write 4.6 as a ratio of two integers.

$4.6 = 4\frac{\square}{10} = \frac{\square}{10}$

2. Compare $-1\frac{4}{5}$ and $\frac{2}{3}$.

Every negative number is _____ (less/greater) than every positive number.

So, $-1\frac{4}{5}$ ◯ $\frac{2}{3}$.

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SKILL 16: Practice

Write each rational number as a ratio of two integers.

1. $-3\frac{3}{4}$ _____
2. $1\frac{6}{7}$ _____
3. -0.8 _____
4. $-\frac{5}{6}$ _____
5. $-4\frac{2}{5}$ _____
6. $-\frac{34}{35}$ _____
7. 0.55 _____
8. $-1.\overline{3}$ _____
9. $8\frac{2}{3}$ _____

Use >, <, or = to compare the rational numbers.

10. $\frac{2}{3} \bigcirc \frac{1}{4}$
11. $-\frac{2}{3} \bigcirc -\frac{3}{4}$
12. $-5\frac{1}{2} \bigcirc 7\frac{1}{2}$
13. $3\frac{1}{5} \bigcirc -7\frac{2}{5}$
14. $-1\frac{1}{4} \bigcirc -1\frac{1}{5}$
15. $-\frac{3}{4} \bigcirc -\frac{3}{8}$
16. $-5.5 \bigcirc -5\frac{1}{2}$
17. $\frac{2}{3} \bigcirc -\frac{19}{20}$
18. $-3\frac{7}{8} \bigcirc -1\frac{5}{6}$
19. $\frac{4}{5} \bigcirc -12\frac{3}{4}$
20. $0.7 \bigcirc -0.9$
21. $0 \bigcirc -0.3$
22. $-\frac{1}{3} \bigcirc -0.\overline{3}$
23. $\frac{17}{16} \bigcirc -\frac{17}{16}$
24. $0.\overline{6} \bigcirc \frac{2}{3}$
25. $\frac{5}{8} \bigcirc \frac{3}{32}$
26. $-\frac{16}{3} \bigcirc -\frac{14}{3}$
27. $0.75 \bigcirc \frac{3}{4}$

Solve.

28. On Monday, the temperature went down to $-15°F$ at a weather station in Canada. On Tuesday, the temperature dropped to $-19.5°F$. Which day had the lower temperature?

    _____

29. Last year, Lucille grew 1.25 inches. Berta grew $1\frac{2}{3}$ inches. Which girl grew more?

    _____

TEST PREP

30. Which number is greater than $-\frac{2}{3}$? *Skill 16*

    A $-\frac{1}{3}$ C $-\frac{4}{5}$

    B $-\frac{3}{4}$ D -1

31. Find $-7 + 18$. *Skill 4*

    F -25 H 11

    G -11 J 25