

2-4

NAME _____ DATE _____

Rational Numbers (Pages 93–99)

A **rational number** is a number that can be expressed in the form $\frac{a}{b}$, where a and b are integers and b is not equal to 0.

Comparing Rational Numbers	<ul style="list-style-type: none"> If the graph of a is to the left of the graph of b on a number line, then $a < b$. For any two numbers a and b, exactly one of these is true: $a < b$ $a = b$ $a > b$ You can use cross products to compare two fractions. For rational numbers $\frac{a}{b}$ and $\frac{c}{d}$, with $b > 0$ and $d > 0$, <ol style="list-style-type: none"> if $\frac{a}{b} < \frac{c}{d}$, then $ad < bc$, and if $ad < bc$, then $\frac{a}{b} < \frac{c}{d}$.
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EXAMPLES

A Replace $\underline{?}$ to make $\frac{13}{15} \underline{?} \frac{15}{16}$ a true sentence.

$$\frac{13}{15} \underline{?} \frac{15}{16}$$

Find the cross products.

$$13 \cdot 16 \underline{?} 15 \cdot 15$$

$$208 < 225$$

The true sentence is $\frac{13}{15} < \frac{15}{16}$.

B Use a calculator to write the fractions $-\frac{1}{4}$, $-\frac{5}{8}$, and $\frac{2}{9}$ as decimals. Then order the fractions from least to greatest.

$$-1 \div 4 = -0.25 \quad -5 \div 8 = -0.625$$

$$2 \div 9 = 0.222\dots \text{ or } 0.\bar{2}$$

The decimals from least to greatest are -0.625 , -0.25 , $0.\bar{2}$. So the fractions should be ordered $-\frac{5}{8}$, $-\frac{1}{4}$, $\frac{2}{9}$.

PRACTICE

Replace each $\underline{?}$ with $<$, $>$, or $=$ to make each sentence true.

1. $4 - 6 \underline{?} -2$

2. $\frac{17}{4} \underline{?} 5$

3. $\left(\frac{1}{6}\right)(7) \underline{?} \left(\frac{1}{9}\right)(6)$

4. $10 \underline{?} \left(\frac{20}{3} - \frac{21}{3}\right)$

5. $5.4 \underline{?} (6.2 - 2.4)$

6. $\frac{11}{12} \underline{?} \frac{13}{14}$

Write the numbers in each set in order from least to greatest.

7. $\frac{1}{8}, \frac{3}{16}, \frac{1}{5}$

8. $-\frac{3}{8}, \frac{3}{5}, -\frac{2}{3}$

9. $0.4, -\frac{3}{7}, -0.1$

10. $-\frac{5}{16}, -\frac{4}{13}, -\frac{1}{8}$

11. $-\frac{1}{7}, -\frac{2}{5}, -0.7$

12. $\frac{8}{25}, \frac{11}{17}, \frac{4}{15}$



13. Standardized Test Practice Which number is between $\frac{1}{3}$ and $\frac{4}{5}$?

A $\frac{5}{60}$

B $\frac{17}{60}$

C $\frac{37}{60}$

D $\frac{51}{60}$

Answers: 1. = 2. < 3. < 4. < 5. < 6. < 7. $\frac{8}{16} = \frac{1}{2}$ 8. $-\frac{3}{2} < -\frac{3}{3} < -\frac{3}{3}$ 9. $-\frac{7}{3} < -0.1 < 0.4$ 10. $-\frac{16}{5} < -\frac{13}{4} < -\frac{8}{1}$ 11. $-0.7, -\frac{5}{2}, -\frac{7}{1}$ 12. $\frac{15}{4}, \frac{16}{8}, \frac{25}{11}$ 13. C