

Comparing and Ordering Rational Numbers

Name: _____ Date: _____ Score: _____ / 24

Q Quick Review

To compare two rational numbers, picture the **number line**: the number farther to the *right* is always **greater**. This means every positive number is greater than every negative number, and 0 sits in between. With two negatives, the one *closer to zero* is greater — so $-3 > -7$. To compare fractions or decimals, rewrite them in the same form (a common denominator, or all decimals) so the comparison is easy. Use $<$ for “less than,” $>$ for “greater than,” and $=$ for “equal to.”

◇ **Example:** Compare $-\frac{3}{4}$ and $-\frac{1}{2}$ using $<$ or $>$.
 ⇒ Both numbers are negative, so think about the number line. Let us give them a common denominator of 4: $-\frac{1}{2} = -\frac{2}{4}$, while $-\frac{3}{4}$ stays the same. Now compare $-\frac{3}{4}$ and $-\frac{2}{4}$. On the number line, $-\frac{3}{4}$ is farther left (farther from zero), so it is the smaller number. That means $-\frac{3}{4} < -\frac{1}{2}$.

Answer: $-\frac{3}{4} < -\frac{1}{2}$

PRACTICE

Compare each pair using $<$, $>$, or $=$.

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|---|-------|--|-------|
| 1. $5 \square 9$ | _____ | 11. $0.5 \square 0.45$ | _____ |
| 2. $-3 \square 2$ | _____ | 12. $-0.5 \square -0.05$ | _____ |
| 3. $-3 \square -7$ | _____ | 13. $\frac{3}{5} \square 0.6$ | _____ |
| 4. $-10 \square -4$ | _____ | 14. $\frac{2}{3} \square 0.7$ | _____ |
| 5. $0 \square -6$ | _____ | 15. $-2 \square -2$ | _____ |
| 6. $-8 \square 0$ | _____ | 16. $-\frac{7}{2} \square -3$ | _____ |
| 7. $\frac{1}{2} \square \frac{3}{4}$ | _____ | 17. $\frac{9}{4} \square 2$ | _____ |
| 8. $\frac{2}{3} \square \frac{1}{2}$ | _____ | 18. $-1.25 \square -1.5$ | _____ |
| 9. $-\frac{1}{2} \square -\frac{3}{4}$ | _____ | 19. Order 3, -2, 0 least to greatest | _____ |
| 10. $-\frac{2}{3} \square -\frac{5}{6}$ | _____ | 20. Order -1, -5, -3 least to greatest | _____ |

◆ Word Problems

21. On Monday the low temperature was -3°F and on Tuesday it was -8°F . Which day was colder? _____
22. Three divers are at depths -12 m, -7 m, and -15 m. Order their depths from highest (closest to the surface) to lowest. _____
23. Two runners finished a race $\frac{2}{3}$ second and $\frac{3}{5}$ second behind the winner. Who finished closer to the winner? _____
24. Bank balances are $-\$15$, $\$5$, and $-\$20$. Order them from least to greatest. _____



Answer Keys

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| <ol style="list-style-type: none"> 1. $5 < 9$ 2. $-3 < 2$ 3. $-3 > -7$ 4. $-10 < -4$ 5. $0 > -6$ 6. $-8 < 0$ 7. $\frac{1}{2} < \frac{3}{4}$ 8. $\frac{2}{3} > \frac{1}{2}$ 9. $-\frac{1}{2} > -\frac{3}{4}$ 10. $-\frac{2}{3} > -\frac{5}{6}$ 11. $0.5 > 0.45$ 12. $-0.5 < -0.05$ | <ol style="list-style-type: none"> 13. $\frac{3}{5} = 0.6$ 14. $\frac{2}{3} < 0.7$ 15. $-2 = -2$ 16. $-\frac{7}{2} < -3$ 17. $\frac{9}{4} > 2$ 18. $-1.25 > -1.5$ 19. $-2, 0, 3$ 20. $-5, -3, -1$ 21. Tuesday 22. $-7, -12, -15$ 23. the $\frac{3}{5}$-second runner 24. $-20, -15, 5$ |
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Step-by-Step Explanations

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| <ol style="list-style-type: none"> 1. 9 is farther right on the number line, so $5 < 9$. 2. Every negative number is less than every positive, so $-3 < 2$. 3. With two negatives, the one closer to zero is greater: $-3 > -7$. 4. -10 is farther from zero, so it is less: $-10 < -4$. 5. Zero is greater than every negative number, so $0 > -6$. 6. Every negative number is less than zero, so $-8 < 0$. 7. Common denominator: $\frac{2}{4} < \frac{3}{4}$. 8. Common denominator 6: $\frac{4}{6} > \frac{3}{6}$. 9. $-\frac{2}{4} > -\frac{3}{4}$ since $-\frac{1}{2}$ is closer to zero. 10. $-\frac{4}{6} > -\frac{5}{6}$, so $-\frac{2}{3}$ is greater. 11. $0.50 > 0.45$ when you compare place by place. 12. -0.5 is farther from zero than -0.05, so it is less. 13. $\frac{3}{5} = 0.6$ exactly, so they are equal. 14. $\frac{2}{3} \approx 0.667$, which is less than 0.7. | <ol style="list-style-type: none"> 15. The same number is equal to itself: $-2 = -2$. 16. $-\frac{7}{2} = -3.5$, which is less than -3. 17. $\frac{9}{4} = 2.25$, which is greater than 2. 18. -1.25 is closer to zero than -1.5, so it is greater. 19. From left to right on the number line: -2, then 0, then 3. 20. The most negative comes first: -5, then -3, then -1. 21. $-8 < -3$ because -8 is farther from zero on the number line, so Tuesday was colder. 22. Closest to the surface means closest to zero: -7 is highest, then -12, then -15 is deepest. 23. Common denominator 15: $\frac{2}{3} = \frac{10}{15}$ and $\frac{3}{5} = \frac{9}{15}$. Since $\frac{9}{15} < \frac{10}{15}$, the $\frac{3}{5}$-second runner was closer. 24. -20 is the most negative, then -15, and 5 is the only positive, so it is greatest. |
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