Comparing and Ordering Rational Numbers

Name: _____ Date: _____ Score: _____ / 24

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 =.

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

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Answer Keys

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. $-0.5 < -0.05$
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. $-20, -15, 5$

Step-by-Step Explanations

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.
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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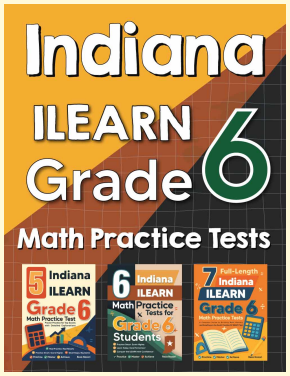

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