Adding and Subtracting Rational Numbers

Name: _____	Date: _____	Score: _____ / 17

This is where everything you have learned about fractions, decimals, and integer signs comes together! To add or subtract rational numbers, the first step is to get the numbers into a form you can combine—find the LCD for fractions, or line up decimal points for decimals. When subtraction gets confusing, remember the trick: rewrite it as *adding the opposite*. Apply the sign rules carefully and you will get both the correct value *and* the correct sign every time.

Key Concepts & Quick Review

Same signs: add absolute values; keep common sign. **Example:** $-\frac{3}{4}+(-\frac{1}{4})=-\frac{4}{4}=-1$

Different signs: subtract absolute values; keep sign of larger. **Subtraction:** $a-b=a+(-b)$ (add the opposite)

LCD first when denominators differ.

Examples

① Find $-\frac{3}{4}+\left(-\frac{1}{3}\right)$.

Think It Through: Both numbers are negative, so they have the same sign. That means we add their absolute values and keep the negative sign at the end. To add $\frac{3}{4}$ and $\frac{1}{3}$, first use the LCD 12. Rewrite them as $\frac{9}{12}$ and $\frac{4}{12}$, then add to get $\frac{13}{12}$. Finally put the negative back: $-\frac{13}{12}=-1\frac{1}{12}$. Same signs means the movement goes in the same direction on the number line.

Answer: $-1\frac{1}{12}$

② The temperature changed $-2.5°$F in the morning and $-1.75°$F in the afternoon. What was the total temperature change for the day?

Think It Through: Since both changes are negative, add the absolute values: $2.5+1.75=4.25$. Then keep the negative sign because both changes were drops. So the total change is $-4.25°$F. In words, the temperature fell by $4.25°$F during the day. A negative result here makes sense because every change in the problem was a drop.

Answer: $-4.25°F$

Practice Problems

Add or subtract each rational number expression. Simplify your answer.

1. $-\frac{3}{4}+\frac{1}{4}=$ _____

2. $\frac{5}{6}+\left(-\frac{1}{6}\right)=$ _____

3. $-\frac{7}{8}-\frac{1}{8}=$ _____

4. $-\frac{2}{3}+\frac{1}{2}=$ _____

5. $\frac{3}{4} - \left(-\frac{1}{3}\right) =$ _____

6. $-\frac{5}{6} + \frac{3}{4} =$ _____

7. $-0.8 + (-0.5) =$ _____

8. $-2.75 + 1.5 =$ _____

9. $3.6 - (-1.4) =$ _____

10. $-4.2 - (-3.7) =$ _____

11. $-\frac{3}{5} + \left(-\frac{7}{10}\right) =$ _____

12. $1\frac{1}{4} + \left(-\frac{3}{4}\right) =$ _____

13. $-2\frac{1}{3} - \frac{2}{3} =$ _____

14. $-1\frac{5}{6} + \frac{5}{6} =$ _____

15. $\frac{7}{8} - \left(-\frac{3}{8}\right) - \frac{5}{4} =$ _____

Study Tips

- When mixing fractions and decimals, convert everything to the same form before adding or subtracting.
- For subtraction, always rewrite as addition of the opposite *first*: $-\frac{5}{6} - (-\frac{1}{4}) = -\frac{5}{6} + \frac{1}{4}$.
- Watch for zero pairs: $-\frac{3}{4} + \frac{3}{4} = 0$. Spotting them early simplifies multi-step problems dramatically.

Word Problems

16. A mountain climber's elevation changes by $-\frac{7}{8}\,km$ in the morning (descending into a valley) and $+\frac{5}{6}\,km$ in the afternoon (ascending). Find the net elevation change for the day. Did the climber end up higher or lower than the starting point, and by how many kilometers?

_____

17. A scientist records these temperature changes over five days: $-2\frac{1}{4}$ °F, $+1.75$ °F, $-\frac{3}{8}$ °F, $+0.5$ °F, and $-1\frac{1}{8}$ °F. Convert all values to fractions with a common denominator and find the total temperature change. Then find the average daily change by dividing the total by 5.

_____

Answer Keys

1) $-\frac{1}{2}$
2) $\frac{2}{3}$
3) -1
4) $-\frac{1}{6}$
5) $\frac{13}{12}$
6) $-\frac{1}{12}$
7) $-\frac{13}{10}$
8) $-\frac{5}{4}$
9) 5
10) $-\frac{1}{2}$
11) $-\frac{13}{10}$
12) $\frac{1}{2}$
13) -3
14) -1
15) 0
16) $-\frac{1}{24}$ km lower
17) Total $-1.5°$F; average $-0.3°$F per day

Step-by-Step Explanations

Tutoring notes not found for this topic.

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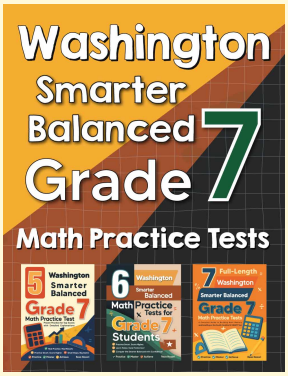

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