MATHEMATICS · GRADES 7-9

Fractions involving negative numbers

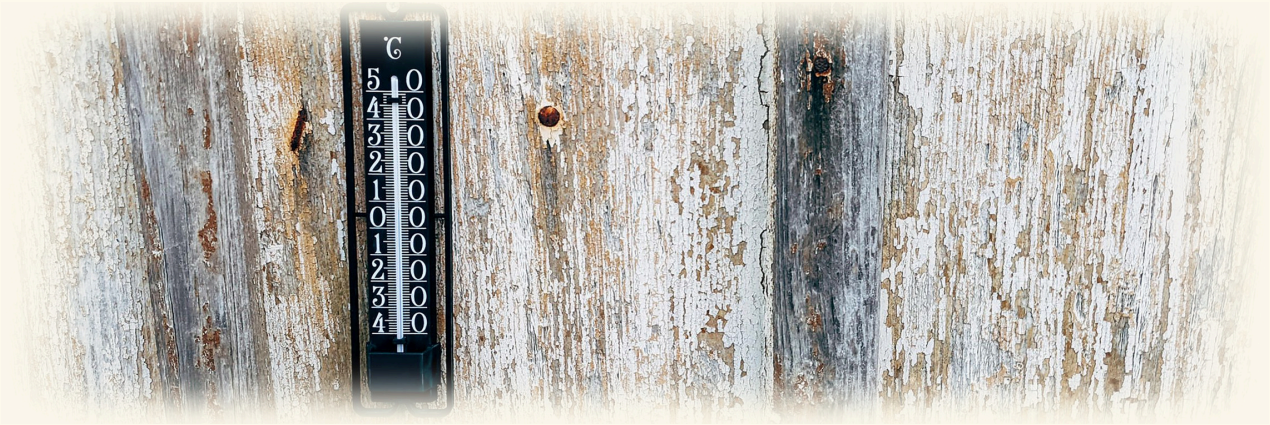
Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you handle parts of something owed or below zero, like a fraction of a debt or a temperature below freezing. A negative fraction is still just a part of something, only the something is a debt, a loss, or a temperature under zero. You need it to work out half of what you still owe on a bill, a fraction of a temperature drop overnight, or a share of a loss split between partners.

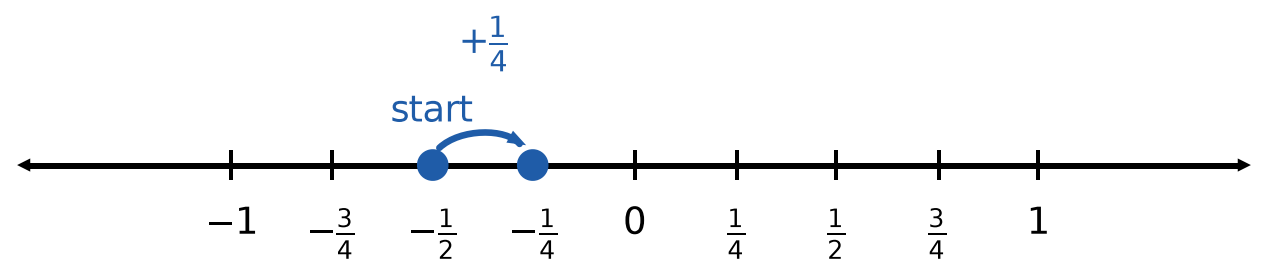


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Worked examples

EXAMPLE 1

Q Work out $-\frac{1}{2} + \frac{1}{4}$



SOLUTION

Write both with denominator 4: $-\frac{2}{4} + \frac{1}{4}$

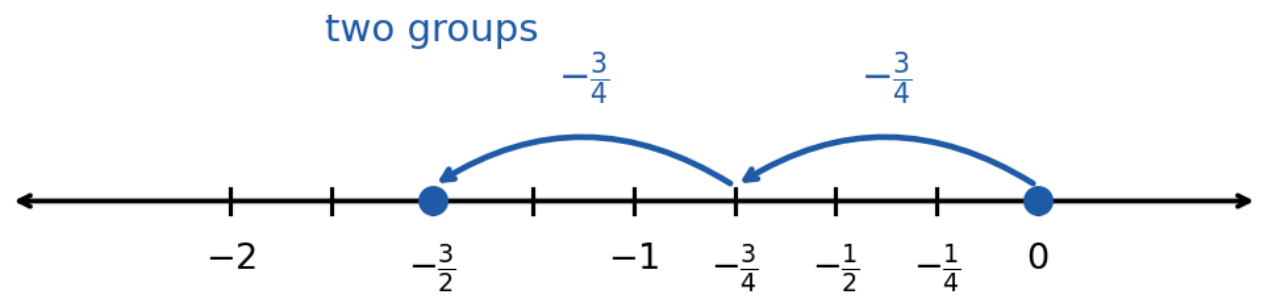
Add the numerators, keep the denominator: $-2 + 1 = -1$, so $-\frac{1}{4}$

The answer is negative because the negative part was larger.

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EXAMPLE 2

Q Work out $(-\frac{3}{4}) \times 2$



SOLUTION

Multiply the numerator by 2: $-3 \times 2 = -6$, so $-\frac{6}{4}$

$$-\frac{6}{4} = \frac{-6 \div 2}{4 \div 2} = -\frac{3}{2}$$

A fraction is in lowest terms when the top and bottom numbers have no common factor left except 1.

As a mixed number that is $-1\frac{1}{2}$ (see Converting improper fractions to mixed numbers).

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Practice questions

1 Work out $-\frac{2}{3} + \frac{1}{4}$. Write the answer as a fraction in lowest terms, or as a whole number.

A $-\frac{1}{12}$

B $\frac{5}{12}$

C $-\frac{5}{12}$

D $-\frac{11}{12}$

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2 Work out $-\frac{1}{4} - \frac{1}{4}$. Write the answer as a fraction in lowest terms, or as a whole number.

A $-\frac{1}{2}$

B $\frac{1}{2}$

C $-\frac{1}{4}$

D -1

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3 Work out $-\frac{2}{3} + \frac{1}{3}$. Write the answer as a fraction in lowest terms, or as a whole number.

A $-\frac{1}{3}$

B $\frac{1}{3}$

C $-\frac{2}{3}$

D $-\frac{1}{2}$

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4 Work out $-\frac{5}{6} \times 2$. Write the answer as a fraction in lowest terms, or as a whole number.

A $-\frac{5}{3}$

B $\frac{5}{3}$

C $-\frac{5}{6}$

D $-\frac{5}{12}$

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5 Work out $-\frac{1}{2} \times 4$. Write the answer as a fraction in lowest terms, or as a whole number.

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6 Work out $-\frac{3}{5} \div 3$. Write the answer as a fraction in lowest terms, or as a whole number.

A $\frac{1}{5}$

B $-\frac{3}{5}$

C $-\frac{1}{15}$

D $-\frac{1}{5}$

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7 Work out $-\frac{1}{3} \times -6$. Write the answer as a fraction in lowest terms, or as a whole number.

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8 Work out $\frac{2}{3} \times (-\frac{3}{4})$. Write the answer as a fraction in lowest terms, or as a whole number.

A $-\frac{1}{2}$

B $\frac{1}{2}$

C $-\frac{1}{4}$

D $-\frac{2}{3}$

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9 Work out $\frac{1}{2} - -\frac{1}{2}$. Write the answer as a fraction in lowest terms, or as a whole number.

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10 Work out $(-\frac{2}{3})^2$. Write the answer as a fraction in lowest terms, or as a whole number.

A $\frac{4}{9}$

B $-\frac{4}{9}$

C $\frac{2}{3}$

D $-\frac{2}{3}$

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ANSWER KEY

1. $-\frac{5}{12}$

2. $-\frac{1}{2}$

3. $-\frac{1}{3}$

4. $-\frac{5}{3}$

5. -2

6. $-\frac{1}{5}$

7. 2

8. $-\frac{1}{2}$

9. 1

10. $\frac{4}{9}$

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