

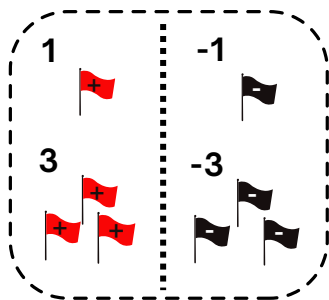
Addition of Negative Numbers

Name _____

Time _____

Score _____

Positive + Negative



$$\begin{array}{l} \text{3 red flags} + \text{1 black flag} = \text{2 red flags} \\ 3 + (-1) = 2 \\ \text{5 red flags} + \text{3 black flags} = \text{2 red flags} \\ 5 + (-3) = 2 \end{array}$$

Step 1: Keep winner team's sign
Step 2: Fight to find the difference

Negative + Negative

$$\begin{array}{l} \text{3 black flags} + \text{6 black flags} = \text{9 black flags} \\ (-3) + (-6) = -9 \end{array}$$

Step 1: Keep the same sign
Step 2: Find the sum

Positive + Negative

★ $8 + (-5) =$

★ $21 + (-12) =$

★ $54 + (-92) =$

★ $200 + (-13) =$

Negative + Positive

★ $-5 + 5 =$

★ $-9 + 14 =$

★ $-150 + 27 =$

★ $-318 + 155 =$

Negative + Negative

★ $-3 + (-6) =$

★ $-57 + (-23) =$

★ $-110 + (-100) =$

★ $-8.2 + (-12.8) =$

Challenge

★ $-58 + 12 + 231 + (-200) =$

★ $1 - 2 + 3 - 4 + 5 - 6 + 7 - 8 + 9 - 10 =$

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Subtraction of Negative Numbers

Name _____

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Score _____

💡 Subtracting a negative number = adding the opposite

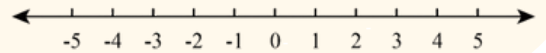
💡 Find the opposite!

- The opposite of 1: -1
- The opposite of 2: -2
- The opposite of -3: 3
- Find the opposite of 5: ____

💡 Extension: Absolute value!

The absolute value of a number x , written as $|x|$, is the distance from zero to that number on the number line.

When $x > 0$, $|x| = x$;
When $x = 0$, $|x| = 0$;
When $x < 0$, $|x| = -x$.



👉 Example:

- $3 - (-2) = 3 + 2$ (2 is the opposite of -2)

👉 Example:

- $|3| = 3$, $|-3| = 3$

✎ Positive - Negative

★ $10 - (-5) =$

★ $25 - (-6) =$

★ $50 - (-20) =$

★ $4.2 - (-1.3) =$

✎ Negative - Positive

★ $-3 - 2 =$

★ $-6 - 4 =$

★ $-15 - 9 =$

★ $-30 - 25 =$

✎ Negative - Negative

★ $-10 - (-5) =$

★ $-110 - (-100) =$

★ $-60 - (-50) =$

★ $-8.2 - (-12.8) =$

🧐 Challenge

★ $-25 - 15 - (-10) + (-8) =$

★ $|-5+8| + |-3-6| =$



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💡 Multiplication of Negative Numbers

- The multiplication of  and  = 

☞ **Example:** $3 \times (-2)$
 $= (-2) \times (-2) \times (-2)$
 $= -6$

- Step 1:** Determine the sign 
- Step 2:** Calculate the value

- The multiplication of  and  = 

☞ **Example:** $(-6) \times (-3)$
 $= (-6) \times (0 - 3)$
 $= (-6) \times 0 - (-6 \times 3)$
 $= 0 - (-18)$
 $= 18$

- Step 1:** Determine the sign 
- Step 2:** Calculate the value



Positive × Negative

★ $50 \times (-36) =$

★ $0 \times (-400) =$

★ $23 \times (-5.2) =$

★ $25 \times (-21) =$

Negative × Positive

★ $-5 \times 12 =$

★ $-17 \times 4 =$

★ $-123 \times 3 =$

★ $-1.5 \times 6 =$

Negative × Negative

★ $-5 \times (-6) =$

★ $-18 \times (-15) =$

★ $-12 \times (-\frac{5}{12}) =$

★ $-2.5 \times (-4.2) =$

Challenge

★ $-24 \times (\frac{1}{3} + \frac{5}{6} + \frac{3}{8}) =$



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💡 Division of Negative Numbers

- The division of and =

👉 **Example:** $(-4) \div 2$
 $= (0-4) \div 2$
 $= (0 \div 2) + (-4 \div 2)$
 $= -2$

- Step 1: Confirm the sign
- Step 2: Calculate the answer

- The division of and =

👉 **Example:** $(-6) \div (-3)$
 $= (-6) \div (0 - 3)$
 $= (-6 \div 0) - (-6 \div 3)$
 $= 2$

- Step 1: Confirm the sign
- Step 2: Calculate the answer

Positive ÷ Negative

★ $6 \div (-2) =$

★ $14 \div (-6) =$

★ $30 \div (-5) =$

★ $120 \div (-10) =$

Negative ÷ Positive

★ $-18 \div 5 =$

★ $-59 \div 7 =$

★ $-150 \div 50 =$

★ $-200 \div 200 =$

Negative ÷ Negative

★ $-45 \div (-5) =$

★ $-6.6 \div (-1.1) =$

★ $-12 \div (-10) =$

★ $-3 \div (-\frac{3}{16}) =$

Challenge

★ $-6 + 2 \div (-3) \times \frac{3}{16} =$



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Mixed Operations with Fractions

Name _____

Time _____

Score _____

Example: $\frac{1}{4} + \frac{1}{12}$

Step1: Find the least common multiple of 4 and 12 → 12.

Step2: Express the fractions on denominator 12

$$= \frac{3}{12} + \frac{1}{12} = \frac{4}{12}$$

Step3: Simplify the fraction by dividing both on their greatest common divisor 4 →

$$= \frac{4 \div 4}{12 \div 4} = \frac{1}{3}$$

💡 Subtraction of fractions follows the same rule.

Example: $\frac{3}{4} \times \frac{1}{6}$

Step1: Multiply nominators and denominators

$$= \frac{3 \times 1}{4 \times 6} = \frac{3}{24}$$

Step2: Simplify the fraction by dividing both on their greatest common divisor → 3

$$= \frac{3 \div 3}{24 \div 3}$$

$$= \frac{1}{8}$$

💡 Division of fractions follows the same rule.

 Calculation of Fractions

★ $\frac{3}{10} + \frac{11}{25} =$

★ $\frac{3}{17} - \frac{3}{7} =$

★ $\frac{15}{16} + \frac{7}{12} =$

★ $\frac{5}{8} - \frac{7}{12} =$

★ $\frac{13}{21} + \frac{3}{14} =$

★ $\frac{25}{32} - \frac{7}{24} =$

 Mixed Calculation

★ $(-\frac{3}{8}) \times \frac{1}{3} \times \frac{2}{5} =$

★ $(-\frac{3}{8}) + \frac{3}{8} \div \frac{2}{5} =$

★ $\frac{11}{21} \times \frac{21}{11} \times (-\frac{4}{9}) =$

★ $\frac{13}{55} \times \frac{7}{13} \div (-\frac{119}{165}) =$

 Challenge

★ $\frac{3}{5} \times \frac{5}{3} \div \frac{21}{35} + \frac{1}{21} - (-\frac{2}{3}) =$



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Mixed Operations with Fractions

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💡 Different Types of Fractions:

$$\frac{9}{5}$$

Larger
Smaller

Improper Fraction

$$1\frac{4}{5}$$

Mixed Fraction

- Improper Fraction → Mixed Fraction

$$\frac{9}{5} = \frac{5}{5} + \frac{4}{5} = 1 + \frac{4}{5} = 1\frac{4}{5}$$

$$\frac{5}{3} = \frac{3}{3} + \frac{2}{3} = \underline{\hspace{1cm}}$$

- Mixed Fraction → Improper Fraction

$$2\frac{1}{2} = \frac{5}{2} \quad \text{👉} \quad 3\frac{1}{3} = \underline{\hspace{1cm}}$$

👉 Tip: if you see mixed types of fractions, converse mixed fraction into improper fraction



Fraction Addition

$$\star \quad 3\frac{4}{5} + 2\frac{3}{10} =$$

$$\star \quad \frac{17}{5} + \frac{11}{20} =$$

$$\star \quad 2\frac{1}{8} + 6\frac{1}{5} =$$

$$\star \quad \frac{17}{15} + \frac{151}{150} =$$

$$\star \quad 1\frac{7}{9} + 7\frac{11}{3} =$$

$$\star \quad \frac{13}{3} + \frac{3}{13} =$$



Mixed Calculation

$$\star \quad \frac{5}{3} + 3\frac{1}{7} =$$

$$\star \quad \frac{7}{9} \times (-\frac{9}{3}) =$$

$$\star \quad (-\frac{13}{11}) \times \frac{9}{10} =$$

$$\star \quad 2\frac{1}{9} \div (-\frac{7}{3}) =$$



Challenge

★ A man had $4\frac{2}{5}$ pounds of potatoes. If $\frac{2}{3}$ pounds of potatoes were used for cooking, how many pounds of potatoes are left?



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