**ADDICTION AND SUBTRACTION**

To add or subtract fractions they must have the same denominator (the bottom value).

**Addition and Subtraction with the same denominators**

If the denominators are already the same then it is just a matter of either adding or subtracting the numerators (the top value).

Addition: \( \frac{A}{B} + \frac{C}{B} = \frac{A+C}{B} \)

Example: \( \frac{3}{4} + \frac{2}{4} = \frac{3+2}{4} = \frac{5}{4} \)

Subtraction: \( \frac{A}{B} - \frac{C}{B} = \frac{A-C}{B} \)

Example: \( \frac{3}{4} - \frac{2}{4} = \frac{3-2}{4} = \frac{1}{4} \)

**Addition and Subtraction with different denominators**

If the denominators are different then a common denominator needs to be found. This is most easily done by creating a common denominator that is the product of the two differing denominators. To achieve this multiply the denominator and the numerator of each fraction by the opposite denominator. This is actually the same as multiplying 1 and so we aren’t really changing anything.

Addition: \( \frac{A}{B} + \frac{C}{D} = \frac{AD + BC}{BD} \)

Example: \( \frac{3}{5} + \frac{2}{3} = \frac{3(3) + 2(5)}{15} = \frac{19}{15} \)

Subtraction: \( \frac{A}{B} - \frac{C}{D} = \frac{AD - BC}{BD} \)

Example: \( \frac{2}{3} - \frac{3}{5} = \frac{2(5) - 3(3)}{15} = \frac{1}{15} \)

**MULTIPLICATION**

To multiply fractions simply multiply the nominators and multiply the denominators:

\( \frac{A}{B} \times \frac{C}{D} = \frac{AC}{BD} \)

Example: \( \frac{4}{7} \times \frac{2}{6} = \frac{8}{42} = \frac{4}{21} \)

**DIVISION**

To divide one fraction by another we must flip the second fraction and then multiply with the first:

\( \frac{A}{B} \div \frac{C}{D} = \frac{A}{B} \times \frac{D}{C} = \frac{AD}{BC} \)

Example: \( \frac{2}{3} \div \frac{4}{7} = \frac{2}{3} \times \frac{7}{4} = \frac{14}{12} = \frac{7}{6} \)

**PRACTICE**

1) \( \frac{2}{7} + \frac{4}{3} = \)

2) \( \frac{3}{4} \times \frac{5}{6} = \)

3) \( \frac{7}{12} \div \frac{2}{3} = \)

4) \( \frac{7}{12} - \frac{3}{8} = \)

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*Check your answers on the back.*
# Explanation | Workings | Answer
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1. **Before you can add or subtract, the fractions should have the same bottom number – a Common Denominator.**

\[
\frac{2}{7} + \frac{4}{3} = \frac{2(3)}{7(3)} + \frac{4(7)}{3(7)} = \frac{34}{21}
\]

2. **Multiply the bottom numbers and multiply the top numbers. Then simplify the fraction by cancelling by 3.**

\[
\frac{3}{4} \times \frac{5}{6} = \frac{3 \times 5}{4 \times 6} = \frac{15}{24} = \frac{5}{8}
\]

3. **Turn the second fraction upside down and multiply. 21 and 24 have a common factor of 3, so divide top and bottom by 3.**

\[
\frac{7}{12} \div \frac{2}{3} = \frac{7}{12} \times \frac{3}{2} = \frac{7 \times 3}{12 \times 2} = \frac{21}{24}
\]

4. **Before you can add or subtract, the fractions should have the same bottom number – a Common Denominator.**

\[
\frac{7}{12} - \frac{3}{8} = \frac{14}{24} - \frac{9}{24} = \frac{5}{24}
\]