

Rules for fractions

ADDITION 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 $\frac{A}{B} + \frac{C}{D} = \frac{AD}{BD} + \frac{BC}{BD} = \frac{AD+BC}{BD}$ Example $\frac{3}{5} + \frac{2}{3} = \frac{3(3)}{5(3)} + \frac{2(5)}{3(5)} = \frac{9+10}{15} = \frac{19}{15}$

Subtraction $\frac{A}{B} - \frac{C}{D} = \frac{AD}{BD} - \frac{BC}{BD} = \frac{AD-BC}{BD}$ Example $\frac{2}{3} - \frac{3}{5} = \frac{2(5)}{3(5)} - \frac{3(3)}{5(3)} = \frac{10-9}{15} = \frac{1}{15}$

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) $\frac{7}{12} - \frac{3}{8} =$

Check your answers on the back.

#	Explanation	Workings	Answer
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 .	$\frac{7}{12} - \frac{3}{8} = \frac{14}{24} - \frac{9}{24}$	$= \frac{5}{24}$

STUDENT LEARNING CENTRE
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