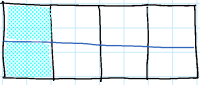


Fractions



Equivalent Fractions

$$\frac{2}{8} \xrightarrow{2 \div 2} \frac{1}{4}$$

$$\frac{8}{8} \xrightarrow{8 \div 2} \frac{4}{4}$$

① Adding and Subtracting:

a) $\frac{7}{8} + \frac{3}{8} = \frac{10}{8}$ *When you have a common den., add or subtract numerator only

b) $\frac{4}{9} - \frac{3}{9} = \frac{1}{9}$

② Making Equivalent Fractions:

REDUCE

a) $\frac{10 \div 5}{15 \div 5} = \frac{2}{3}$ b) $\frac{18 \div 3}{27 \div 3} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$

c) $\frac{96 \div 2}{108 \div 2} = \frac{48 \div 6}{54 \div 6} = \frac{8}{9}$

Find LCD

You need a common denom. to ADD or SUBTRACT fractions

a) $\frac{4 \times 2}{7 \times 2}$ and $\frac{9}{14}$ LCD: 14

$\frac{8}{14}$ $\frac{9}{14}$

6, 12, 18, 24
9, 18, 27

b) $\frac{5 \times 3}{6 \times 3}$ and $\frac{2 \times 2}{9 \times 2}$ LCD: 18

$\frac{15}{18}$ $\frac{4}{18}$

3, 6, 9, 12, 15
5, 10, 15

c) $\frac{2 \times 5}{3 \times 5}$ and $\frac{1 \times 3}{5 \times 3}$ LCD: 15

$\frac{10}{15}$ $\frac{3}{15}$

③ Conversions:

From Proper to Improper → Numerator > Denomin.
No whole number in front.

- Numerator < Denominator
- whole number might be present

a) $1 \frac{2}{3} = \frac{5}{3}$ b) $4 \frac{1}{2} = \frac{9}{2}$ c) $5 \frac{5}{6} = \frac{35}{6}$

From Improper to Proper

a) $\frac{7^{-5}}{5} = 1 \frac{2}{5}$ b) $\frac{12^{-10}}{5} = 2 \frac{2}{5}$ c) $\frac{19^{-16}}{4} = 4 \frac{3}{4}$

d) $\frac{53^{-42}}{14} = 3 \frac{11}{14}$ e) $\frac{49^{-48}}{6} = 8 \frac{1}{6}$ f) $\frac{77^{-72}}{12} = 6 \frac{5}{12}$

$77 \div 12 = 6.4166...$
 $6 \times 12 = 72$

$$77 \div 12 = 6.4166\dots$$

$$6 \times 12 = 72$$

④ Solve. Put answers in LOWEST PROPER FORM:

★ Must have a common denominator ★

ADD & SUBTRACT

$$a) \frac{3}{4} + \frac{3}{8} = \frac{6}{8} + \frac{3}{8} = \frac{9}{8} = 1\frac{1}{8}$$

$$b) \frac{7}{10} - \frac{3}{5} = \frac{7}{10} - \frac{6}{10} = \frac{1}{10}$$

$$c) \frac{13}{9} + \frac{10}{9} = \frac{23}{9} = 2\frac{5}{9}$$

$$d) 3\frac{2}{3} - 1\frac{1}{6} = \frac{11}{3} - \frac{7}{6} = \frac{22}{6} - \frac{7}{6} = \frac{15}{6} = 2\frac{3}{6} = 2\frac{1}{2}$$

⑤ Multiplying Fractions:

★ No common Denominator ★

★ Always use improper form ★

$$a) \frac{2}{3} \times \frac{5}{7} = \frac{10}{21} \quad b) \frac{1}{3} \times \frac{6}{8} = \frac{6}{24} = \frac{1}{4}$$

$$c) 2\frac{1}{3} \times \frac{4}{5} = \frac{7}{3} \times \frac{4}{5} = \frac{28}{15} = 1\frac{13}{15}$$

$$d) \frac{7}{8} \times 3 = \frac{21}{8} = 2\frac{5}{8}$$

★ Change Whole Numbers into fraction by making denominator 1.

★ When multiplying, you can check for CROSS-CANCELING ★

$$e) \frac{13}{4} \times \frac{1}{26} = \frac{1}{8}$$

Diagram: A blue arrow points from 13 to 26, and a red arrow points from 26 to 4. The 3 in 13 and 2 in 26 are crossed out. The result $\frac{1}{8}$ is circled in blue.

$$f) \frac{210}{312} \times \frac{14}{25} = \frac{2}{15}$$

Diagram: A purple arrow points from 210 to 25, and a red arrow points from 25 to 14. A blue arrow points from 14 to 12, and a red arrow points from 12 to 3. The 10 in 210 and 4 in 14 are crossed out. The result $\frac{2}{15}$ is circled in purple.

⑥ Dividing fractions

★ Create a reciprocal of the 2nd fraction
↳ flip it!

★ Then just multiply ★

$$a) \frac{1}{4} \div \frac{3}{5} = \frac{5}{12}$$

Diagram: A blue arrow points from 3 to 5, and a purple arrow points from 5 to 4. The result $\frac{5}{12}$ is circled in purple.

$$b) \frac{5}{1} \div \frac{1}{9} = \frac{45}{1}$$

Diagram: A purple arrow points from 1 to 9. The result $\frac{45}{1}$ is circled in purple.