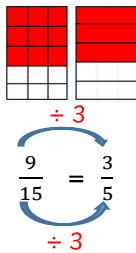


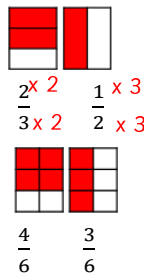
Use common factors to simplify fractions.

- 1) Find a number that both the numerator and the denominator can be divided by (in this case, 3)
- 2) Divide both the numerator and denominator by that number.



Use multiples to express fractions in the same denominator

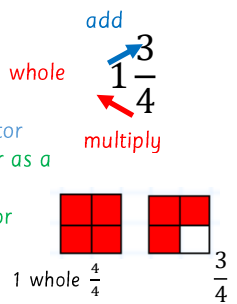
- 1) Find a number that is a common multiple of both denominators (in this case, 6)
- 2) Multiply both fractions by the relevant multiple to reach the new denominator



Convert mixed numbers to improper fractions

- 1) Multiply the denominator by the whole number.
- 2) Add the numerator
- 3) Write the answer as a numerator over the existing denominator

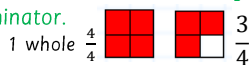
$$1\frac{3}{4} = \frac{7}{4}$$



Convert improper fractions to mixed numbers

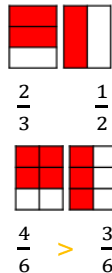
- 1) See how many times the denominator will go into the numerator (once, with a remainder of 3)
- 2) Write the answer (1) as the whole number
- 3) Write the remainder (3) as the numerator over the existing denominator.

$$\frac{7}{4} = 1\frac{3}{4}$$



Compare fractions

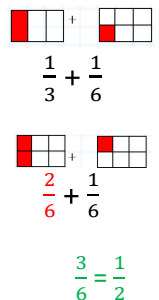
- 1) Decide on a common multiple of the two denominators to become the new denominator
- 2) Convert both fractions to have the same denominator.
- 3) Decide which symbol to use- which fraction is larger?



Add proper fractions

- 1) Convert both fractions to have the same denominator
- 2) Add the numerators, but not the denominators.
- 3) Simplify the answer if you can

$$\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$$



Add mixed numbers (method 1)

- 1) Change any mixed numbers to improper fractions.
- 2) Convert both fractions to have the same denominator
- 3) Add the numerators together.
- 4) Change any improper fractions back to mixed numbers
- 5) Simplify the answer if you can.

$$1\frac{3}{4} + 1\frac{3}{8}$$

$$\frac{7}{4} + \frac{11}{8}$$

$$\frac{14}{8} + \frac{11}{8}$$

$$\frac{14}{8} + \frac{11}{8} = \frac{25}{8}$$

$$\frac{25}{8} = 3\frac{1}{8}$$

Add mixed numbers (method 2)

- 1) Add the two whole numbers together.
- 2) Convert both fractions to have the same denominator.
- 3) Add the numerators together.
- 4) Change any improper fractions back to mixed numbers
- 5) Add together your two answers.
- 6) Simplify the answer if you can.

$$1\frac{3}{4} + 1\frac{3}{8}$$

$$1 + 1 = 2$$

$$\frac{6}{8} + \frac{3}{8}$$

$$\frac{6}{8} + \frac{3}{8} = \frac{9}{8}$$

$$\frac{9}{8} = 1\frac{1}{8}$$

$$2 + 1\frac{1}{8} = 3\frac{1}{8}$$

Subtract proper fractions

- 1) Convert both fractions to have the same denominator
- 2) Subtract the numerators, but not the denominators.
- 3) Simplify the answer if you can



$$\frac{2}{3} - \frac{1}{6}$$



$$\frac{4}{6} - \frac{1}{6}$$

$$\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$$

$$\frac{3}{6} = \frac{1}{2}$$

Subtract mixed numbers

- 1) Change any mixed numbers to improper fractions.
- 2) Convert both fractions to have the same denominator.
- 3) Subtract the second numerator from the first.
- 4) Change any improper fractions back to mixed numbers.
- 5) Simplify the answer if you can.

$$2\frac{3}{4} - 1\frac{1}{8}$$

$$\frac{11}{4} - \frac{9}{8}$$

$$\frac{22}{8} - \frac{9}{8}$$

$$\frac{22}{8} - \frac{9}{8} = \frac{13}{8}$$

$$\frac{13}{8} = 1\frac{5}{8}$$

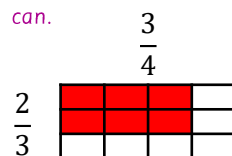
Multiply pairs of proper fractions

- 1) Multiply the numerators
- 2) Multiply the denominators
- 3) Simplify the answer if you can.

$$\frac{3}{4} \times \frac{2}{3}$$

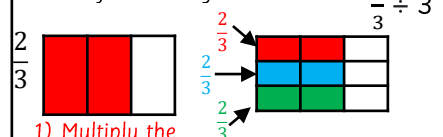
$$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$$

$$\frac{6}{12} = \frac{1}{2}$$



Divide fractions by whole numbers

- 1) Multiply the denominator by the whole number and write the answer as the new denominator.
- 2) Simplify the answer if you can.



$$\frac{2}{3} \div 3 = \frac{2}{9}$$

Multiply fractions by whole numbers

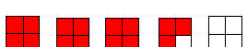
- 1) Write the whole number as a fraction over 1.
- 2) Multiply the numerators
- 3) Multiply the denominators
- 4) Change any improper fractions back to mixed numbers
- 5) Simplify the answer if you can

$$\frac{3}{4} \times 5$$

$$\frac{3}{4} \times \frac{5}{1}$$

$$\frac{3}{4} \times \frac{5}{1} = \frac{15}{4}$$

$$\frac{15}{4} = 3\frac{3}{4}$$



Multiply mixed numbers by whole numbers (method 1)

- 1) Change any mixed numbers to improper fractions
- 2) Write the whole number as a fraction over 1.
- 3) Multiply the numerators
- 4) Multiply the denominators
- 5) Change any improper fractions back to mixed numbers.
- 6) Simplify the answer if you can.

$$3\frac{3}{4} \times 5$$

$$\frac{15}{4} \times 5$$

$$\frac{15}{4} \times \frac{5}{1}$$

$$\frac{15}{4} \times \frac{5}{1} = \frac{75}{4}$$

$$\frac{75}{4} = 18\frac{3}{4}$$

Multiply mixed numbers by whole numbers (method 2)

- 1) Multiply the two whole numbers together.
- 2) Multiply the fraction by the whole number.
- 3) Change any improper fractions back to mixed numbers.
- 4) Add your two answers together.
- 5) Simplify the answer if you can.

$$3 \times 5 = 15$$

$$\frac{3}{4} \times \frac{5}{1} = \frac{15}{4}$$

$$\frac{15}{4} = 3\frac{3}{4}$$

$$15 + 3\frac{3}{4} = 18\frac{3}{4}$$