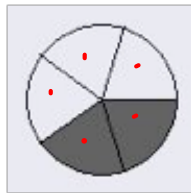


1-4: Operations with Fractions

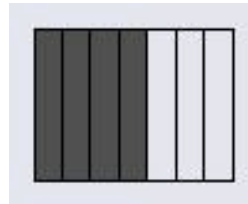
From the video, the denominator represents how many equal pieces the cake is cut into and the numerator represent how many pieces the number would take.

Fractions are splitting a whole into equal pieces.

What fraction is shaded grey?



$$\frac{2}{5}$$



$$\frac{4}{7}$$

In the video, the sheriff discovers that $\frac{2}{3} = \frac{4}{6}$

Two fractions that equal one another but are written in a different form are called equivalent fractions.

We can find equivalent fractions by multiplying or dividing the numerator AND denominator by a common number.

$$\frac{6}{10} \cdot \frac{2}{2} = \frac{12}{20}$$

$$\frac{6}{10} \div \frac{2}{2} = \frac{3}{5}$$

Name 2 equivalent fractions for the following

$$\frac{4}{12}, \frac{1}{3}, \frac{8}{24}, \frac{2}{6}$$

Find the value of x

$$\frac{x}{20} = \frac{4}{5}$$

Handwritten notes: A red arrow points from 4 to 16, and another red arrow points from 5 to 20.

$$\frac{2}{7} = \frac{6}{x}$$

Handwritten notes: A red '3' is written above the 2 and below the 7. A red box contains the number 21.

Adding and Subtracting Fractions

When adding and subtracting fractions, the first thing to do is find the LCD - least common denominator, or the smallest number that both denominators go into.

Find the LCD for the following fractions:

$$\frac{2}{3} \text{ and } \frac{5}{12}$$

Handwritten notes: A red bracket groups the denominators 3 and 12. A red arrow points from 12 to 24. A list of multiples for 3 is written vertically: 3, 6, 9, 12, 15.

$$\frac{1}{4} \text{ and } \frac{2}{5}$$

Handwritten notes: A red bracket groups the denominators 4 and 5. A list of multiples for 4 is written vertically: 4, 8, 12, 16, 20. A list of multiples for 5 is written vertically: 5, 10, 15, 20, 25. The number 20 is circled in red.

What is multiplied by the denominator has to be multiplied by the numerator

Then keep the denominator and perform the given operation on the numerators.

A fraction is in reduced form when the greatest common factor of the numerator and denominator is one.

Always make sure to simplify to lowest terms!

$$\frac{6}{4} \rightarrow \frac{3}{2}$$

Add the following Fractions:

$$\frac{2 \cdot 2}{2 \cdot 3} + \frac{5}{6} = \frac{4}{6} + \frac{5}{6} = \frac{9}{6} = \frac{3}{2} = 1\frac{1}{2}$$


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



$$\frac{6 \cdot 1}{6 \cdot 3} + \frac{-4}{18} = \frac{1}{9} + \frac{-4}{18} = \frac{2}{18} = \frac{1}{9}$$

Subtract the following Fractions:

$$3 \cdot \frac{5}{4} - \frac{1 \cdot 4}{3 \cdot 4} = \frac{15}{12} - \frac{4}{12} = \boxed{\frac{11}{12}}$$



$$\frac{4}{4} \cdot \frac{2}{3} + \frac{5}{12} - \frac{1 \cdot 2}{6 \cdot 2} = \frac{8}{12} + \frac{5}{12} - \frac{2}{12} = \boxed{\frac{11}{12}}$$

When multiplying and dividing fractions we **DO**
NOT need a LCD - least common denominator

To multiply fractions, multiply the numerators together
 and the denominators together.

After multiplying straight across, always look to see if you can
simplify

Multiply the following fractions

$$\frac{4}{7} \cdot \frac{1}{3} = \frac{4 \cdot 1}{7 \cdot 3} = \boxed{\frac{4}{21}}$$



$$\frac{-2}{3} \cdot \frac{5}{8} = \frac{-2 \cdot 5}{3 \cdot 8} = \frac{-10}{24} = \boxed{\frac{-5}{12}}$$

$$\frac{5}{4} \div \frac{4}{5}$$

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

To divide two fractions, leave the first fraction as it is and then multiply by the reciprocal of the second fraction. Then look to see if you can simplify.

Divide the following fractions

$$\frac{7}{2} \div \frac{2}{3} \rightarrow \frac{7}{2} \cdot \frac{3}{2} = \boxed{\frac{21}{4}}$$



$$\frac{-3}{4} \div \frac{5}{8} \rightarrow \frac{-3}{4} \cdot \frac{8}{5} = \frac{-24}{20} = \frac{-12}{10} = \boxed{\frac{-6}{5}}$$

When multiplying or dividing a whole number by a fraction, make the whole number a fraction by making the denominator a 1

$$\frac{6}{1} \cdot \frac{3}{4} = \frac{6}{1} \cdot \frac{3}{4} = \frac{18}{4} = \boxed{\frac{9}{2}}$$

$$\frac{3}{5} \cdot \frac{1}{3} \div \frac{2}{1} \rightarrow \frac{3}{5} \cdot \frac{1}{3} \cdot \frac{1}{2} = \frac{3}{30} = \boxed{\frac{1}{10}}$$

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- | | |
|-------------------|---------------------|
| 1. 14 | 2. 75 |
| 3. $\frac{7}{16}$ | 4. $\frac{19}{24}$ |
| 5. $\frac{1}{12}$ | 6. $\frac{4}{9}$ |
| 7. $\frac{2}{5}$ | 8. $\frac{1}{4}$ |
| 9. $\frac{3}{2}$ | 10. $-\frac{16}{9}$ |