Questions

Simplifying fractions

1. Simplify $\frac{25}{125}$.

2. Simplify $\frac{14}{21}$.

3. Simplify $\frac{5}{19}$.

4. Simplify $\frac{8}{48}$.

Adding and subtracting fractions

1. What is $\frac{8}{9} + \frac{1}{12}$?

2. What is $\frac{4}{12} - \frac{2}{3}$?

3. What is $\frac{1}{5} + \frac{-3}{10}$?

Multiplying fractions

1. What is $\frac{1}{2} \times \frac{3}{4}$?

2. What is $\frac{5}{4} \times \frac{1}{3}$?

3. What is $4 \times \frac{1}{2}$?

Dividing fractions

1. What is $\frac{4}{5} \div \frac{1}{2}$?

2. What is $\frac{2}{12} \div \frac{6}{7}$?

3. What is $\frac{1}{8} \div 2$?

Improper fractions

1. Write $\frac{13}{6}$ as a mixed number.

2. Write $\frac{6}{2}$ as a mixed number.

3. Write $\frac{15}{4}$ as a mixed number.

4. Write $4\frac{2}{3}$ as an improper fraction.

5. Write $6\frac{1}{5}$ as an improper fraction.

6. Write 3 as an improper fraction, with a denominator of 3.

Comparing fraction size

1. Which of these fractions is larger: $\frac{1}{3}$, or $\frac{3}{8}$?

2. Put these fractions in size order, beginning with the smallest: $\frac{1}{2}, \frac{2}{5}, \frac{5}{8}, \frac{5}{32}$, and $\frac{2}{3}$.

3. Put these fractions in size order, beginning with the smallest: $\frac{1}{9}, \frac{9}{8}$, 1, $\frac{2}{15}$, and $\frac{7}{6}$.

Answers

Simplifying fractions

1. 25 and 125 have a common factor of 25, so we divide the numerator and denominator by 25, to get $\frac{25}{125} = \frac{1}{5}$. There are no more common factors other than 1, so this is the simplified answer.

2. 14 and 21 have a common factor of 7, so we divide the numerator and denominator by 7, to get $\frac{14}{21} = \frac{2}{3}$. 2 and 3 have no common factors other than 1, so this is the simplified answer.

3. 5 and 19 have no common factors, so the fraction is already simplified.

4. 8 and 48 have a common factor of 8, so we divide the numerator and denominator by 8, to get $\frac{1}{6}$. 1 and 6 have no common factors other than 1, so this is the simplified answer.

Adding and subtracting fractions

1. $\frac{8}{9} + \frac{1}{12} = \frac{(8 \times 12) + (1 \times 9)}{9 \times 12} = \frac{105}{108} = \frac{35}{36}.$

2. $\frac{4}{12}$ can be simplified to give $\frac{1}{3}$, so the question becomes: $\frac{1}{3} - \frac{2}{3} = \frac{-1}{3}.$

3. $\frac{1}{5} + \frac{-3}{10} = \frac{(1 \times 10) + (-3 \times 5)}{(5 \times 10)} = \frac{10-15}{50} = \frac{-5}{50} = \frac{-1}{10}.$

Multiplying fractions

1. $\frac{1}{2} \times \frac{3}{4} = \frac{1 \times 3}{2 \times 4} = \frac{3}{8}.$

2. $\frac{5}{4} \times \frac{1}{3} = \frac{5 \times 1}{4 \times 3} = \frac{5}{12}.$

3. $4 \times \frac{1}{2} = \frac{4}{1} \times \frac{1}{2} = \frac{4 \times 1}{1 \times 2} = \frac{4}{2} = 2.$

Dividing fractions

1. $\dfrac{4}{5} \div \dfrac{1}{2} = \dfrac{4}{5} \times \dfrac{2}{1} = \dfrac{4 \times 2}{5 \times 1} = \dfrac{8}{5} = 1\dfrac{3}{5}.$

2. $\dfrac{2}{12} \div \dfrac{6}{7} = \dfrac{1}{6} \times \dfrac{7}{6} = \dfrac{1 \times 7}{6 \times 6} = \dfrac{7}{36}.$

3. $\dfrac{1}{8} \div 2 = \dfrac{1}{8} \div \dfrac{2}{1} = \dfrac{1}{8} \times \dfrac{1}{2} = \dfrac{1 \times 1}{8 \times 2} = \dfrac{1}{16}.$

Improper fractions

1. $\dfrac{13}{6} = 2.1\dot{5}.$ Therefore, we calculate: $\dfrac{13}{6} - \dfrac{2 \times 6}{6} = \dfrac{13 - 12}{6} = \dfrac{1}{6}.$

   So, we have that: $\dfrac{13}{6} = 2\dfrac{1}{6}.$

2. $\dfrac{6}{2} = 3.$ This is a whole number, rather than a mixed number, but we cannot write the fraction as a mixed number, so we leave it as 3.

3. $\dfrac{15}{4} = 3.75.$ Therefore, we calculate $\dfrac{15}{4} - \dfrac{3 \times 4}{4} = \dfrac{15 - 12}{4} = \dfrac{3}{4}.$

   So, we have that $\dfrac{15}{4} = 3\dfrac{3}{4}.$

4. $4\dfrac{2}{3} = \dfrac{(4 \times 3) + 2}{3} = \dfrac{12 + 2}{3} = \dfrac{14}{3}.$

5. $6\dfrac{1}{5} = \dfrac{(6 \times 5) + 1}{5} = \dfrac{31}{5}.$

6. $3 = \dfrac{3 \times 3}{3} = \dfrac{9}{3}.$

Comparing fraction size

1. We calculate $\dfrac{1}{3} \times \dfrac{8}{8} = \dfrac{8}{24},$ and $\dfrac{3}{8} \times \dfrac{3}{3} = \dfrac{9}{24}.$

Therefore, we can see that $\frac{3}{8}$ is larger than $\frac{1}{3}$.

2. The easiest way to do a question like this is to choose the fraction that you think will be in the middle, and then compare all the other fractions to that fraction.

In this question, we choose $\frac{1}{2}$.

Comparing $\frac{1}{2}$ and $\frac{2}{5}$:

We calculate $\frac{1}{2} \times \frac{5}{5} = \frac{5}{10}$, and $\frac{2}{5} \times \frac{2}{2} = \frac{4}{10}$.

Therefore, we can see that $\frac{1}{2}$ is larger than $\frac{2}{5}$.

Comparing $\frac{1}{2}$ and $\frac{5}{8}$:

We calculate $\frac{1}{2} \times \frac{8}{8} = \frac{8}{16}$, and $\frac{5}{8} \times \frac{2}{2} = \frac{10}{16}$.

Therefore, we can see that $\frac{5}{8}$ is larger than $\frac{1}{2}$.

We repeat this calculation and find that $\frac{2}{3}$ is larger than $\frac{1}{2}$, and that $\frac{1}{2}$ is larger than $\frac{5}{32}$.

Now that we know that $\frac{2}{3}$ and $\frac{5}{8}$ are both larger than $\frac{1}{2}$, we can compare these two fractions.

We calculate $\frac{2}{3} \times \frac{8}{8} = \frac{16}{24}$, and $\frac{5}{8} \times \frac{3}{3} = \frac{15}{24}$.

Therefore, we can see that $\frac{2}{3}$ is larger than $\frac{5}{8}$.

We also know that $\frac{2}{5}$ and $\frac{5}{32}$ are smaller than $\frac{1}{2}$, so we can compare these two fractions.

We calculate $\frac{2}{5} \times \frac{32}{32} = \frac{64}{160}$, and $\frac{5}{32} \times \frac{5}{5} = \frac{25}{160}$.

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Therefore, we can see that $\frac{2}{5}$ is larger than $\frac{5}{32}$.

So, we now have our order, from smallest to largest:

$\frac{5}{32}, \frac{2}{5}, \frac{1}{2}, \frac{5}{8}, \frac{2}{3}$.

3. Since $\frac{9}{8}$ and $\frac{7}{6}$ are improper fractions, we know that they are both larger than 1, so we compare their size:

We calculate $\frac{9}{8} \times \frac{6}{6} = \frac{54}{48}$, and $\frac{7}{6} \times \frac{8}{8} = \frac{56}{48}$. Therefore, we can see that $\frac{7}{6}$ is larger than $\frac{9}{8}$.

Since $\frac{1}{9}$ and $\frac{2}{15}$ are both proper fractions, we know that they are less than 1, so we compare their size:

We calculate $\frac{1}{9} \times \frac{15}{15} = \frac{15}{135}$, and $\frac{2}{15} \times \frac{9}{9} = \frac{18}{135}$. Therefore, we can see that $\frac{2}{15}$ is larger than $\frac{1}{9}$.

So, we have our order:

$\frac{1}{9}, \frac{2}{15}, 1, \frac{9}{8}, \frac{7}{6}$.

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