



Math Review
Volume 1
Fractions

**Math Review: By Carol Ann Goldstein
Demo Volume One**

**Math Review
By Carol Ann Goldstein
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**A sample of the content from:
Volume 1 - Fractions**

Menu

Questions

Answers

Explanations

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Demo Volume One

Questions

FRACTIONS

Write your answer as follows:

If the answer is a fraction such as $\frac{1}{5}$, then write $\frac{1}{5}$.

If the answer is a whole number such as 2, then write 2.

If the answer is a whole number and a fraction such as $2\frac{1}{5}$, then write $2\frac{1}{5}$.

Add the fractions.

1.

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

2.

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

Subtract the fractions.

1.

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

2.

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

Multiply the fractions.

1.

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

2.

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

Divide the fractions.

1.

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

2.

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

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Demo Volume One

Answers

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Add fractions.

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

2.
 $\frac{5}{6}$

Subtract fractions.

1.
0

2.
 $\frac{1}{6}$

Multiply fractions.

1.
 $\frac{1}{4}$

2.
 $\frac{1}{6}$

Divide fractions.

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

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

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Demo Volume One

Explanations

ADD FRACTIONS Question 1

A fraction is written as:

numerator
denominator

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

Step 1: Since each fraction has the same denominator **2**, we can write the following:

$$\frac{1 + 1}{2}$$

Step 2: Now, we can add the 2 numbers in the numerator of our new fraction and we get the following:

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

Step 3: Since the numerator **2** and the denominator **2** are the same we get:

$$1$$

Conclusion: We started out with two fractions and now have a whole number because the sum of one half and one half is a whole or the number **1**.

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

ADD FRACTIONS Question 2

A fraction is written as:

numerator

denominator

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

Step 1: Since each fraction does not have the same denominator, we must find a common denominator- a number that can be divided by each denominator (2 and 3) evenly with no remainder. Since 2 does not divide into 3 evenly and 3 does not divide into 2 evenly, the easiest way to find a common denominator is to multiply the 2 denominators(2 and 3):

$$2 \times 3 = 6$$

6 is the common denominator.

Step 2: We now use the common denominator **6** to create 2 fractions with the same denominator **6**. We multiply the numerator and denominator of each fraction by the number needed to get the denominator equal to 6; in order to maintain the integrity of the original fraction, we have to perform the same operation on the numerator as we perform on the denominator.

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

This becomes:

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

Since each fraction has the same denominator **6**, we can write the following:

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

Step 3: Now, we can add the 2 numbers in the numerator of our new fraction and we get the following:

$$\frac{5}{6}$$

Conclusion: We started out with two fractions and now have a new fraction.

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

SUBTRACT FRACTIONS Question 1

A fraction is written as:

numerator
denominator

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

Step 1: Since each fraction has the same denominator **2**, we can write the following:

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

Step 2: Now, we can subtract the 2 numbers in the numerator of our new fraction and we get the following:

$$\frac{0}{2}$$

Step 3: Since the numerator is **0** and the denominator is **2** we get:

$$0$$

When 0 is divided by any number(except 0), the result is always 0.

Conclusion: We started out with two fractions and now have 0 because the difference of one half and one half is the number **0**.

$$\frac{1}{2} - \frac{1}{2} = 0$$

SUBTRACT FRACTIONS Question 2

A fraction is written as:

numerator

denominator

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

Step 1: Since each fraction does not have the same denominator, we must find a common denominator- a number that can be divided by each denominator (2 and 3) evenly with no remainder. Since 2 does not divide into 3 evenly and 3 does not divide into 2 evenly, the easiest way to find a common denominator is to multiply the 2 denominators(2 and 3):

$$2 \times 3 = 6$$

6 is the common denominator.

Step 2: We now use the common denominator **6** to create 2 fractions with the same denominator **6**. We multiply the numerator and denominator of each fraction by the number needed to get the denominator equal to 6; in order to maintain the integrity of the original fraction, we have to perform the same operation on the numerator as we perform on the denominator.

$$\frac{1 \times 3}{2 \times 3} - \frac{1 \times 2}{3 \times 2} =$$

This becomes:

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

Since each fraction has the same denominator **6**, we can write the following:

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

Step 3: Now, we can subtract the 2 numbers in the numerator of our new fraction and we get the following:

$$\frac{1}{6}$$

Conclusion: We started out with two fractions and now have a new fraction.

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

MULTIPLY FRACTIONS Question 1

A fraction is written as:

numerator
denominator

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

Step 1: To multiply fractions we cross-multiply, and can write the following:

$$\frac{1 \times 1}{2 \times 2}$$

Step 2: Now, we can multiply the 2 numbers in the numerator and in the denominator of our new fraction and we get the following:

$$\frac{1}{4}$$

Step 3: As a proof of our answer we can say:

$$\frac{1}{2} = \frac{2}{4}$$

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

Conclusion: We started out with two fractions and now have a new fraction.

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

MULTIPLY FRACTIONS Question 2

A fraction is written as:

numerator
denominator

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

Step 1: To multiply fractions we cross-multiply, and can write the following:

$$\frac{1 \times 1}{2 \times 3}$$

Step 2: Now, we can multiply the 2 numbers in the numerator and in the denominator of our new fraction and we get the following:

$$\frac{1}{6}$$

Step 3: As a proof of our answer we can say:

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

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

Conclusion: We started out with two fractions and now have a new fraction.

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

DIVIDE FRACTIONS Question 1

A fraction is written as:

numerator
denominator

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

Step 1: To divide fractions we create a complex fraction by putting the first fraction in the numerator and the second fraction in the denominator, and we get the following:

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

Step 2: Since the numerator **1/2** and the denominator **1/2** are the same we get:

$$1$$

Conclusion: We started out with two fractions and now have a whole number because the quotient of one half divided by one half is a whole or the number **1**.

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

DIVIDE FRACTIONS Question 2

A fraction is written as:

numerator

denominator

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

Step 1: To divide fractions we create a complex fraction by putting the first fraction in the numerator and the second fraction in the denominator, and we get the following:

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

Step 2: We then take the second fraction and create a new second fraction by putting the numerator in the denominator, and the denominator in the numerator (1/3 becomes 3/1). We then multiply the first fraction by this new second fraction and we get the following:

$$\frac{1}{2} \times \frac{3}{1}$$

Step 3: To multiply fractions we cross-multiply, and can write the following:

$$\frac{1 \times 3}{2 \times 1}$$

Step 4: Now, we can multiply the 2 numbers in the numerator and in the denominator of our new fraction and we get the following:

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

Step 5: As a proof of our answer we can say:

$$\frac{1}{2} = \frac{3}{6} \quad \text{AND} \quad \frac{1}{3} = \frac{2}{6}$$

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

Step 6: The answer can also be written as:

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

Note: The fraction **2/2** is equal to **1** because the numerator **2** and the denominator **2** are the same.

DIVIDE FRACTIONS Question 2 (Continued)

Conclusion: We started out with two fractions and now have a whole number and a fraction.

$$\frac{1}{2} \div \frac{1}{3} = \frac{3}{2} \text{ OR } 1 \frac{1}{2}$$