

Fractions

Multiplying & Dividing



This sheet is designed as a review aid. If you have not previously studied this concept or after reviewing the contents you still don't pass you should enroll in the appropriate math class.

Multiplying Fractions

Rules:

- Change mixed fractions to improper fractions. (Mixed fractions are numbers that include both a fraction and a whole number. i.e. $2\frac{1}{3}$):
 - Multiply the denominator (bottom number of the fraction) by the connected whole number.
 - Add the product to the numerator (top number) to get the new numerator.
 - Keep the original denominator.
 - For mixed fraction $2\frac{1}{3}$, multiply $3 \times 2 = 6$, add $6 + 1 = 7 =$ new numerator.
The improper fraction is $\frac{7}{3}$.
- Multiply the numerators to find the numerators in the final product.
- Multiply the denominators to find the denominator in the final product.
- Reduce the product to its simplest terms. Some reducing may also be done before multiplying the top and bottom of the fractions (see method 2 below).

Example:

Problem: $2\frac{1}{3} \times \frac{3}{4} =$

Solution:

Method 1: $2\frac{1}{3} \times \frac{3}{4} = \frac{7}{3} \times \frac{3}{4} = \frac{21}{12} = \frac{7}{4} = 1\frac{3}{4}$

Method 2: $2\frac{1}{3} \times \frac{3}{4} = \frac{7}{\cancel{3}} \times \frac{\cancel{3}}{4} = \frac{7}{4} = 1\frac{3}{4}$

Annotations:

- Change mixed fraction to improper fraction (points to $\frac{7}{3}$ in Method 1)
- Multiply across top and bottom to get new fraction (points to $\frac{21}{12}$ in Method 1)
- Reduce fraction (points to $\frac{7}{4}$ in Method 1)
- Factor out whole numbers (points to $1\frac{3}{4}$ in Method 1)
- Change mixed fraction to improper fraction (points to $\frac{7}{3}$ in Method 2)
- Reduce fraction by canceling out like terms in top and bottom (points to the cancellation of 3s in Method 2)

Dividing Fractions

Rules:

- Change mixed fractions to improper fractions. (Mixed fractions are numbers that include both a fraction and a whole number. i.e. $2\frac{1}{3}$):
 - Multiply the denominator (bottom number of the fraction) by the connected whole number.

- b. Add the product to the numerator (top number) to get the new numerator.
 - c. Keep the original denominator.
 - d. For mixed fraction $2\frac{1}{3}$, multiply $3 \times 2 = 6$, add $6 + 1 = 7 =$ new numerator.
 - e. The improper fraction is $\frac{7}{3}$.
2. Invert the second fraction in the problem (the divisor).
 3. Multiply the numerators to find the numerators in the final product.
 4. Multiply the denominators to find the denominator in the final product.
 5. Reduce the product to its simplest terms. Some reducing may also be done before multiplying the top and bottom of the fractions (see method 2 under Multiplying Fractions).

Example:

Problem: $\frac{3}{4} \div \frac{15}{16} =$

Solution: $\frac{3}{4} \div \frac{15}{16} = \frac{3}{4} \times \frac{16}{15} = \frac{48}{60} = \frac{4}{5}$

↙ Invert divisor and multiply
↘ Reduce fraction

Review:

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

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

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

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

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

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

7) $2\frac{1}{4} \div \frac{2}{3} =$

8) $\frac{3\frac{2}{5}}{6} =$

9) $\frac{3}{4} \div \frac{15}{16} =$

10) $\frac{\frac{3}{4}}{\frac{9}{16}} =$

Check your answers with the key below. If you missed more than two problems, review this paper again, looking for where you may have made a mistake. If you still have trouble with this concept, you may need to enroll in a basic math class, such as the OWATC Math 1 class.

Key:

1) $\frac{5}{16}$

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

3) $1\frac{3}{4}$

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

5) $8\frac{1}{4}$

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

7) $3\frac{3}{8}$

8) $\frac{17}{30}$

9) $\frac{4}{5}$

10) $1\frac{1}{3}$